

TOPOGRAPHIC BASE: UNITED STATES GEOLOGICAL SURVEY, 7.5 MINUTE QUADRANGLE SERIES; NORVELL QUADRANGLE, MICHIGAN 1975; EDITED 1980



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Muskegon, MI (231) 777-3447

Grand Haven, MI (616) 844-1260

Manistee, MI (231) 920-5818 Client:

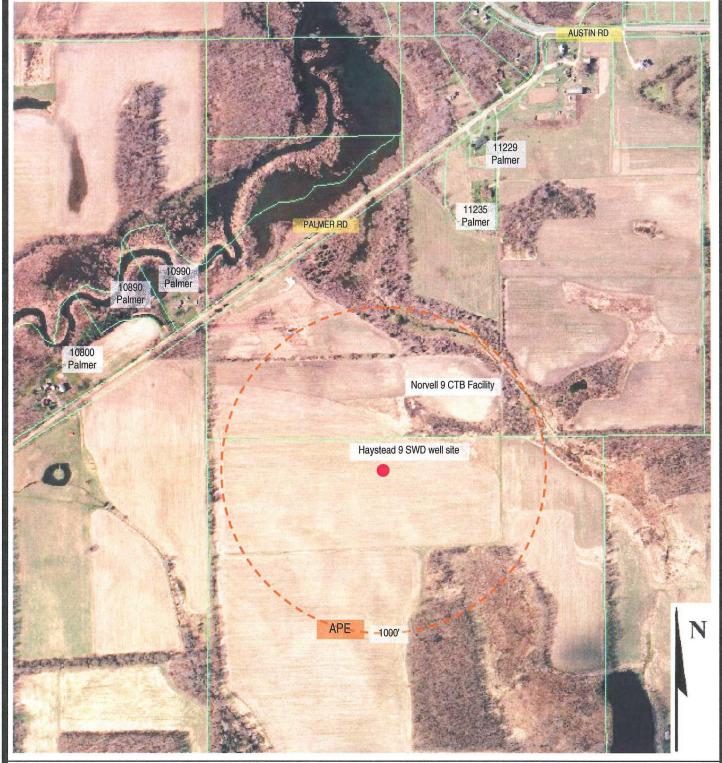
#### **West Bay Exploration Company**

Site:

Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County, Michigan

SITE **LOCATION** MAP

Checked:	WAV
Date:	06/08/11
Drawn by:	JLG
Date:	06/08/11
File No.:	323-130
Figure:	1



VIEW OBTAINED FROM: Jackson County GIS Interactive Mapping Application, Aerial Photograph dated 2007 http://www.co.jackson.mi.us/CountyGIS/viewer.htm



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#### **West Bay Exploration Company**

Site:

Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County, Michigan SITE MAP 
 Checked:
 WAV

 Date:
 06/03/11

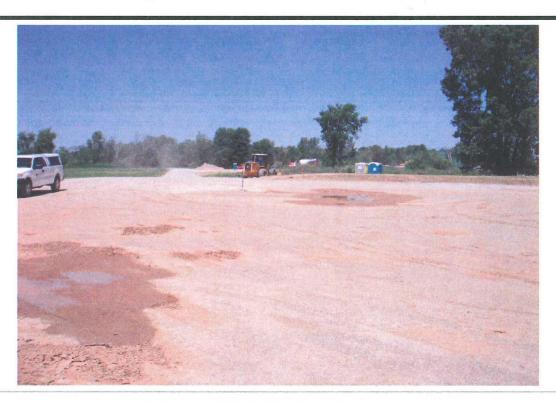
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 JLG

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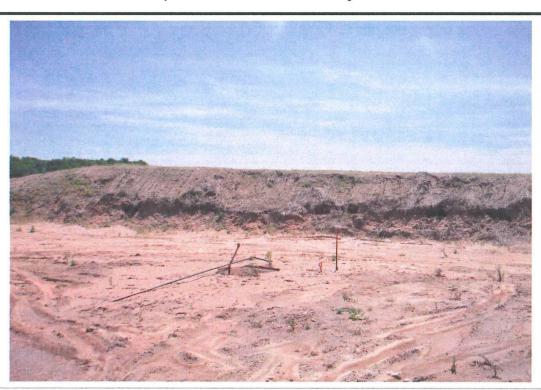
 File No.:
 323-130

 Figure:
 2





At Haystead 9 SWD Well Site - View Looking North



At Haystead 9 SWD Well Site - View Looking South

2

323-130

Site: Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County, Michigan

Photos By: S. Vallier

Client: West Bay Exploration Company

Date: 06/02/11

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File No.:





At Haystead 9 SWD Well Site - View Looking East



At Haystead 9 SWD Well Site - View Looking West

4

323-130

Site: Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County, Michigan

Photos By: S. Vallier

Client: West Bay Exploration Company

Date: 06/02/11

WESTSHORE
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Grand Haven, MI (616) 844-1260 Manistee, MI (231) 920-5818

File No.:





House at 11235 Palmer Road - Located North of Haystead 9 SWD well site - on South Side of Palmer Road



House at 11229 Palmer Road - Located North of Haystead 9 SWD well site - on South Side of Palmer Road

File No.:

323-130

6

Site:

Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County, Michigan

S. Vallier Photos By:

Client: West Bay Exploration Company

06/02/11 Date:

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C O N S U L T I N G
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Manistee, MI (231) 920-5818



House at 10990 Palmer Road
 Located West-Northwest of Haystead 9 SWD well site - on North Side of Palmer Road



8 House at 10890 Palmer Road
- Located West-Northwest of Haystead 9 SWD well site - on North Side of Palmer Road



 House at 10800 Palmer Road
 Located West-Northwest of Haystead 9 SWD well site - on North Side of Palmer Road

Site:	Haystead 9 SWD well site, Section 9, T4S, R2E, Norvell Township, Jackson County,	File No.:	323-130
site.	Michigan	Photos By:	S. Vallier
Client:	West Bay Exploration Company	Date:	06/02/11

# Appendix 4

# West Bay Exploration company

13685 S. West Bay Shore / Suite 200 Traverse City, MI 49684 231-946-0200 / Fax: 231-946-8180

5555 N. Hogback Road Fowlerville, MI 48836 517-223-4011 / Fax: 517-223-4020

April 18, 2011

Permits and Bonding Unit Office of Geological Survey Oil and Gas Division PO Box 30256 Lansing, MI 18909-7756

RE:

Haystead 1-9 SWD

Enclosed, please find the materials necessary to apply for a permit to drill the Haystead 1-9 SWD.

- 1. Application for Permit to Drill and Operate A Well (7200-1)
- 2. Survey Record of Well Location (7200-2)
- 3. Supplemental Plat Drawing
- 4. Wellhead Blowout Control System & Testing Procedures (7200-4)
- 5. Soil Erosion and Sedimentation Control Plan (7200-18)
- 6. Environmental Impact Assessment (7200-19)
- 7. Injection well data (7200-14) and required attachments
- 8. Letter to Jackson County Clerk's Office
- 9. Notification of Landowner letter
- 10. Credit Card Transaction Authorization

If you have any questions regarding the above, please feel free to call us at 231-946-0200. Thanks so much.

Anni Baker

Sincere

West Bay Exploration Co.



13685 S. West Bay Shore / Suite 200 Traverse City, MI 49684 231-946-0200 / Fax: 231-946-8180

5555 N. Hogback Road Fowlerville, MI 48836 517-223-4011 / Fax: 517-223-4020

April 18, 2011

Mr. Harold and Mrs. Harriet Haystead 11451 Austin Road Brooklyn, MI 49230

RE: Haystead 9 SWD

Dear Mr. & Mrs. Haystead:

Enclosed, please find copies of the Application(s) for Permit to Drill, filed by our company with the Department of Environmental Quality-Geological Survey Division.

As you recall with the agreements signed, West Bay is in the process of permitting a saltwater disposal well. The permits required for this are not only the State of Michigan drilling permit, but also, an EPA injection well permit. In order to obtain the EPA permit, the Michigan permit needs to be issued. Once both the permits are issued, we will be in contact with you, in regards to the actual timing of the drilling.

Thank you again, for allowing us to work with you on these projects. We are most appreciative of having landowners like you and your family.

Sincerely,

Anni Baker

Permits & Production Operations Department (231)946-0200- phone anni@wbeco.net – e mail



13685 S. West Bay Shore / Suite 200 Traverse City, MI 49684 231-946-0200 / Fax: 231-946-8180

5555 N. Hogback Road Fowlerville, MI 48836 517-223-4011 / Fax: 517-223-4020

April 18, 2011

County of Jackson County Clerk's Office 312 South Jackson Street Jackson, MI 49201

RE:

Haystead 1-9 SWD

To Whom It May Concern:

Enclosed, please find an Application for Permit to Drill, filed by our company with the Department of Environmental Quality-Geological Survey Division.

This letter serves as notification of our intent to drill the subject well in Jackson County in the near future.

Should you have any questions, please feel free to contact our office at (231)946-0200

Sincerely

Ann M. Baker

**Operations & Production** 

Department



State of Mich Department of Environmental Quality Geological and Land Management Division P.O. Box 30256 Lansing, MI 48909-7756

#### **PERMIT TO**

#### **✓** DRILL AND OPERATE DEEPEN AND OPERATE

GRANTED UNDER THE PROVISIONS OF Part 615 Supervisor of Wells, Act 451, PA 1994, as amended

Violation of and/or non-compliance with the provisions of this act or its rules, instructions or orders of the supervisor, or these permit conditions may result in penalties. This permit includes as requirements all the operations and methods proposed by the applicant in the application to drill, unless rejected or altered by the DEQ. This permit is also subject to the general and specific conditions identified on this page and/or attached to it. Initiation of any work under this permit confirms the permittee's acceptance and agreement to comply with its terms and conditions.

PERMIT NO.	MIT NO. ISSUE DATE		EXPIRATION DATE			
60425	9/8/2	9/8/2011 9/8/2				
WELL NAME AND NUM	1BER		- ,*			
``	HAYSTE	AD 9 SV	WD			
FORMATION AT TOTAL	L DEPTH	COMPI	LETION FORMATION			
SALINA			SALINA			
PERMITTED TOTAL DEPTH (MEASURED)		PERMITTED TOTAL DEPTH (TVD)				
3100	ft.	3100 ft.				
TYPE OF PERMIT	20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	API NU	JMBER			
Brine Disp	osal Well		21-075-60425-00-00			
ISSUED TO:			***************************************			
WEST BAY EX	PLORATION CO	)				
STE 200						
13685 S WEST	BAYSHORE DR					

TRAVERSE CITY, MI 49684

LOCATION AND FOOTAGES:

SHL: NE NW SW, SEC 9, 4S 2E, NORVELL TWP, JACKSON CO.

2459 FT. FROM S AND 1122 FT. FROM W SECTION LINE.

#### CASING AND SEALING REQUIREMENTS

HOLE DEPTH	HOLE DIA.	CASING O.D.	WT./FT.	GRADE	CONDITION	DEPTH (M.D.)	SACKS CMT	CEMENT TOP	MUD WT.
350'	14 3/4"	11 3/4"	42	H-40	NEW	350'	335	SURFACE	8.4
900'	10 5/8"	8 5/8"	24	J-55	NEW	900'	220	SURFACE	8.5
2870'	7 7/8"	5 1/2"	15.5	J-55	NEW	2870'	450	SURFACE	9.7
3100'	4 3/4"	Open Hole				3100'			9.7

#### SPECIFIC PERMIT CONDITIONS

- 1. Earthen berms and silt fence shall be used around pad perimeter to prevent off-site sedimentation.
- 2. An existing 5" PVC temporary water well at SW corner of pad can be used for onsite freshwater. It shall not be used for drinking water and shall be plugged upon well completion.
- 3. Pit will be in-ground and used as working pit. Pit contents to be solidified and cuttings hauled to an approved landfill.
- 4. Area Geologist Kristy Shimko 517-373-9409 is to be notified prior to pit excavation.
- 5. Well control equipment shall be installed on the 11 3/4" and 8 5/8" casing. All well control features shall be tested according the Rule 324.406.
- 6. Pursuant to RULE 407(7)(b), drilling fluids generated or utilized while drilling below the base of the Detroit River Anhydrite SHALL NOT be placed in the lined pit. Cuttings and the solid fraction of drilling muds generated or utilized while drilling below the base of the Detroit River Anhydrite may be placed in the lined reserve pit if they DO NOT contain free liquids as determined by the US EPA, paint filter test, method 9095, September 1986 edition. Drilling muds and cuttings which contain weighting or lost circulation materials, and which cannot reasonably be treated to eliminate free liquids may be placed in the reserve pit if approved by the authorized representative of the supervisor.
- 7. Copies of all Electric logs run on this well shall be submitted to the Lansing Office of the Geological Survey on paper and electronic format. Log ASCII Standard (LAS) and Tag Image File Format (TIF) files shall be submitted on a compact disc. These files should be named using the well's permit number with the log type name.



SEP 2 0 2011

UIC BRANCH

#### **GENERAL PERMIT CONDITIONS**

- 1. The permittee is required to give notice to public utilities in accordance with Act 53, PA 1974, M.C.L. 460.701-460.718.
- 2. This permit does not convey property rights in either real estate or material, neither does it authorize any injury to any public or personal property.
- 3. This permit does not preclude the necessity of obtaining other local, state, or federal permits which may apply to the drilling or operation of this well.
- 4. All trash and garbage shall be removed from the drill site at the completion of drilling, no garbage may be buried on site.
- 5. This permit allows a well containing hydrogen sulfide to be drilled and tested subject to the Hydrogen Sulfide Management Provisions of the Rules promulgated under Part 615, 1994 PA 451, as amended. Contact the Air Quality Division prior to producing a sour well to determine if an Air Quality Installation or Operation Permit is required.

OFFICE TO BE NOTIFIED PRIOR TO PREPARING LOCATION AND PRIOR TO MOVING IN DRILLING EQUIPMENT

PERMIT ISSUED FOR THE SUPERVISOR OF WELLS BY

EQ 7200 (Rev 12/02)

Lansing (517) 241-1515

Signature of licensed surveyor (affix seal)

EQP 7200-2 (rev. 01/2005)

**Applicant** 

LOGICAL SURVEY

2/17/11

Date

#### SURVEY RECORD OF WELL LOCATION

This information is required by authority of Part 615 Supervisor of Wells, or Part 625 Mineral Wells, of Act 451 PA 1994, as amended, in order to obtain a drilling permit. West Bay Exploration Company

Well name and number

Haystead 9 SWD

1a. Surface location	Township County
NE 1/4 of NW 1/4 of SW 1/4 of section 9 T	4S R 2E Norvell Jackson
1b. If this is a directional well, bottom hole location will be	Township County
1/4 of 1/4 of section T	R
Instructions: Outline drilling unit for oil/gas wells (Part 615) or property the well in two directions from the nearest section, quarter section, and	boundary for mineral wells (Part 625) and spot well location on plat shown. Locate unit (or property, Part 625) lines.
2. The surface location is	
	PLAT BELOW REPRESENTS ONE FULL SECTION
2459 ft. from nearest (N/S) S section line	(1 MILE SQUARE) N ↑
1122 ft. from nearest (E/W) W section line	NORTH LINE SECTION O TASS ROSE AUSTIN RD.
158 ft. from nearest (N/S) N quarter section line	NORTH LINE, SECTION 9, T4S, R2E AUSTIN RD.
1496 ft. from nearest (E/W) E quarter section line	
3. Bottom hole will be (if directional)	7/17/17
ft. from nearest (N/S)section line	
tt. from hearest (N/S)section line	05 Marin 1/1/1/11
ft. from nearest (E/W)section line	PROPERTY SIL
and	
	58. SECTION (19.145)
ft. from nearest (N/S)quarter section line	
ft. from nearest (E/W)quarter section line	1122' 1496' EAST-WEST 1/4 LINE
4. Bottom hole will be (directional or straight)	
	WEST
ft. from nearest (N/S)drilling unit line	
ft. from nearest (E/W)drilling unit line	SOTUH
5. Show access to stake on plat and describe if it is not readily accessible. Go south on I-127 to M-50. Go east on M-50	38
8 miles to Village of Napoleon, continue east for 2.5	NORTH-
miles on Austin Road. Go south and west on Palmer	Q S
Road for 0.8 miles to farm lane to south. Take farm	
lane south for 0.3 miles, then east on farm lane 0.25	
miles to well site.	SOUTH LINE, SECTION 9, T4S, R2E
6. Zoning Residential, effective date	
Initial date of residential zoning	
Other Agricultural	OW DIOTANOSO TO
ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHO A. All roads, power lines, buildings, residences, fresh water wells, a	
B. All lakes, streams, wetlands, drainage-ways, floodplains, enviror	onmentally sensitive areas, natural rivers, critical dune areas, and threatened or
endangered species within 1320 feet of the stake.	all type IIb and III public water supply wells within 800 feet of the well stake.
C. 7. 11 type I and he public water supply wells within 2000 leet and a	an type no and in public water supply wens within 600 feet of the wen stake.
Name of individual who surveyed site	Company Date of survey
Stephen V. Vallier, P.S.	consulting 09/28/2010
Address	Phone 221 777 2447
2534 Black Creek Road, Muskegon, MI 49444	231-171-3441
I CERTIFY THE ABOVE INFORMATION IS COMPLETE A	AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

**PROFESSIONAL** 

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ENCLOSE WITH APPLE



MICHIGAN DEPAR TOF ENVIRONMENTAL QUALITY - OFFICE OF LOGICAL SURVEY

#### SOIL EROSION & SEDIM\_NTATION **CONTROL PLAN**

1. Name and address of applicant West Bay Exploration Company

By authority of Part 91, and Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of	13685 South West Bay Shore Drive, Suite 200
this information may result in fines and/or imprisonment.	Traverse City, MI 49684
☐ Part 615 Oil/Gas Well ☐ Part 625 Mineral Well	Phone: (231) 946-0200 Fax: (231) 946-8180
2. Well or project name:	3. Well or project location:
Haystead 9 SWD	Section(s) 9 T4S R2E
4. Name and address of County or local Enforcement Agent (CEA)	5. Township 6. County
	Norvell Jackson
Jackson County Health Department	7. Date earth changes expected to start
1715 Lansing Avenue, Suite 221	Spring 2011
Jackson, MI 49202	8. Date of expected completion
Phone: (517) 788-4420 Fax: (517) 788-4373	Summer 2011
9. Name and address of person responsible for earth change:	10. Name and address of person responsible for maintenance:
Tim Baker	Tim Baker
West Bay Exploration Company	West Bay Exploration Company
4161 Legion Drive	4161 Legion Drive
Mason, MI 48854	Mason, MI 48854
Phone: (517) 676-5167 Fax: (517) 676-5224	Phone: <u>(517)</u> 676-5167 Fax: <u>(517)</u> 676-5224
11. Send copies of supplemental plat required by Part 615, R 324.201(2)(b)	or R 324.504(4), and this form and all attachments, to CEA.
Date sent to CEA March 21, 2011	*
	GE ACTIVITIES
12. Project description: (Project activities may be permitted sequentially.)	
a. Number of well sites 1 , 0.48 acres	d. Flow line(s) trenched in off well site* N/A feet,acres
b. Number of surface facility sites N/A , ,acres	e. Flow line(s) plowed in off well site* N/A feet, acres
c. New access roads N/A feet, acres	*Contact CEA for fee schedule
13. Describe sites for which permits are being sought under Part 301 (Inland	
Describe sites for which permits are being sought under Part 303 (Wetla	nds) None
List file numbers if known	
14 Areas requiring control structures	
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run	off water is likely, such as runs greater than 500' of moderate slope (5% to 10%),
14 Areas requiring control structures Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500'	here sedimentation to a wetland or drainage way may occur?
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley between the stream of the stre	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas within 500' or larger, with contour lines at Also indicate any of the following erosion control structures that will be used.	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' of a lake or stream; or other areas within 500' or larger, with contour lines at Also indicate any of the following erosion control structures that will be undicate on plan whether erosion control structures are temporary of	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms are stream; or other areas valley bottoms are stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms are stream; or other areas valley bottoms, etc.; areas vithin 500' or larger, with contour lines are stream; or other areas valley bottoms, etc.; areas vithin 500' or larger, with contour lines are stream; or other areas valley bottoms, etc.; areas vithin 500' or larger, with contour lines are stream; or other areas valley bottoms, etc.; areas vithin 500' or larger, with contour lines are stream; or other areas valley bottoms, etc.; areas valley bottom	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.
14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley and indicate any of the following erosion control structures that will be used indicate on plan whether erosion control structures are temporary of the polymers of the plan whether erosion control structures are temporary of the plan whether erosion control structures are tempora	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.
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14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley and indicate any of the following erosion control structures that will be used indicate on plan whether erosion control structures are temporary of □ Diversions □ Culverts □ Sediment basins □ Silt fences □ No  15. Site restoration  ▼ Topsoil will be segregated from subsoil and stockpiled ○R □	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.
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14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley and indicate any of the following erosion control structures that will be used indicate on plan whether erosion control structures are temporary of □ Diversions □ Culverts □ Sediment basins □ Silt fences □ No  15. Site restoration  ▼ Topsoil will be segregated from subsoil and stockpiled ○R □	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals <u>OR</u> percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.  Rip-rap Berms Check dams Other
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14 Areas requiring control structures  Will earth changes occur in areas with slopes of 10% or greater; areas where run narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley bottoms, etc.; areas within 500' of a lake or stream; or other areas valley areas of the following erosion control structures that will be used indicate on plan whether erosion control structures are temporary of the following erosion control structure	where sedimentation to a wetland or drainage way may occur?  a minimum of 20' intervals OR percent slope descriptions.  tilized. Identify location on map and attach detail plan.  r permanent.  Rip-rap Berms Check dams Other  No topsoil on site
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CEA signature\_

Date



MICHIGAN DEPA

'ENT OF ENVIRONMENTAL QUALITY - OFFICE (

**EOLOGICAL SURVEY** 

#### \_NVIRONMENTAL IMPACT ASSESSM\_NT

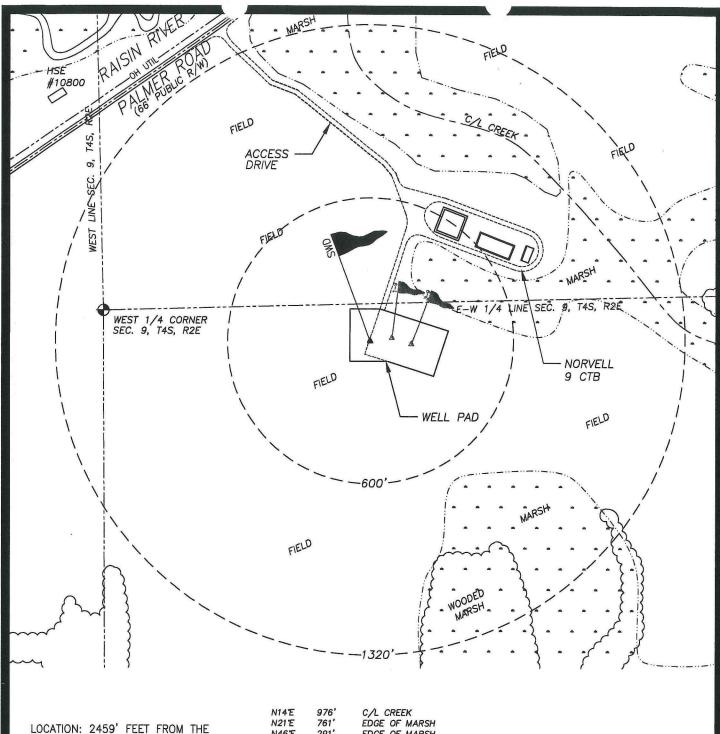
Required for issuance of well permit pursuant to Part 615, 1994 PA 451, as amended. Falsification of this information may result in fines and/or imprisonment. Check all boxes and fill in all blanks which apply to this drilling application. Attach additional pages as necessary.

A. DESCRIPTION OF PROJECT

Applicant's name     West Bay Exploration Company	Well name and num Haystead 9 SWD	per Intended use of well Brine Disposal
2. Mineral ownership, check each category		
	ral Other, iden	
3. Applicable spacing order and drilling u	ınit size	
S.O. 14-9-94 N. Mich. Antrim, 80 acres		S.O. 3-3-95 S. Mich. Antrim, 40 acres
S.O. 1-73 Niagaran, 80 acres		S.O. 2-81 Oakland Co. Niagaran, 40 acres
R 324.301 General rule, 40 acres		☐ S.O. 1-86 P.D.C., 640 acres
☑ Field Spacing or Unitization Order (identi	ty below)	
Order #18-2007 applies  Antrim USP (identify name, number of ac	ree and number of drille	d and permitted wells)
Antilin our (identity harie, humber of ac	nes, and number of unite	d and permitted wells)
		ctions for applying for an administrative spacing exception
Exception to spacing requested, petition	for hearing filed	
☐ Non-producing well, no drilling unit		
4. Applicant's right to drill and produce		
Yes No Are all mineral interests in t		
	OR Certified efforts	s to obtain leases are attached (if allowed by spacing order)
Not applicable, no drilling unit.		to locate the well where it is prepared.
Yes ☐ No Has applicant obtained all of If no, ☐ what additional approvals are need		
	eu:	
5. Special considerations		
☐ Replacement well for permit no ☐ Yes ☒ No Is well expected to encounte		or 🗌 Existing well pad
Yes No is well expected to encounted in a city, town		anulation greater than 70 0002
Other (describe)		
	B IMPACTS AS A B	ESULT OF DRILLING
	D. IIIII AG IG AG A III	- OCT OF DIRECTION
1. Access route dimensions	8	
1560		feet / 43,560 =acres.
		irection and percentage of slopes, land cover and present land use
for the access route while drilling. Identify ro	12	
		e topography of the ground surface along the access route is relatively level.
soil type per the USDA Soil Survey is Brady Sand		st 300 feet. The route is open field. The land use is zoned agricultural. The
Soil type per trie OSDA Soil Survey is Brady Sand	uy Loaiii.	
2. Well site dimensions		
	feet x95	feet / 43,560 =acres.
		direction and percentage of slopes, land cover and present land use
for the well site. Identify well site on attache		as to the parth of a grade of approximately 00/. The drainers is negligible
		es to the north at a grade of approximately 2%. The drainage is northerly to open field. The soil type per the USDA Soil Survey is Ormas-Spinks
Complex.	illurar ariu trie iariu cover is	open field. The soil type per the OSDA Soil Survey is Offias-Spiriks
Complex.		
3. Is well site located in residentially zone	ed area? Yes No	If yes, R324.407(3) and R324.505 apply.
		ey exist on attached plat or project map. How will they be handled if
they are encountered? .		
5. Identify the distance and direction to al		
		man-made features within 600' of the well site.
		ead 1-9A HD1. The Haystead 3-9 well is located 171 feet east. The Norvell
9 CTB facility is located 530 feet northeast. No o	other man-made features ex	ist within 600 feet of the proposed well.
		well site and all Type IIb and Type III public water wells within 800'
of the well site No Type I, II or III public wa	ater supply wells were ide	entified within the specified radii.
(Type Lis a community water supply with year-round serving	ce > 15 living units or > 25 recide	ints. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25
		OGPD IIB <20,000 GPD Type III is a public water supply which is neither type I or II.)

(Part B-5 continued) c. Surface waters, floodplains, wetlands, natural rivers, critical dune areas, threatened or endangered species within 1320' and Great Lake shorelines within 1500' of the well site.  An unnamed tributary to the Raisin River is located 976 feet northeasterly of the well. Marshy areas that drain to the tributary are located 761 feet northeast, 291 feet northeast, and 682 feet southeast of the proposed well. Indiana Bat habitat may exist in the vicinity of the proposed well site, however, this project is unlikely to affect these species because no clearing of suitable bat habitat is anticipated.
d. Describe the actions to be taken to mitigate impacts to any of the items identified in Part B-5 a-c above.  The existing marsh/wetland features will be protected using earthen berms around the well site and strategic soil erosion and sedimentation control measures, such as geotextile silt fence and vegetation preservation outside the limits of the well site and access route. There is no anticipated tree removal or activity that would affect Indiana Bat habitat.
6. Identify the source of fresh water used to drill this well  "Permanent" water well, to be retained after final completion OR used for drinking water (shall be drilled and installed pursuant to Part 127 of 1979 PA 368, as amended)  "Temporary" water well, will be plugged upon final completion and not used for drinking water (consult R 324.403 (2) for minimum construction requirements)  Fresh water will be hauled from existing water well or municipal source (identify)  No fresh water will be used in drilling this well
7. Pit location and handling and disposal of drill cuttings, muds and fluids  Anticipated depth to groundwater 6' +/- Method determined by Topographical Survey  On site in-ground pit, anticipated dimensions: L 100' W 70' D 5'  Remote in-ground pit, anticipated dimensions: L W D Attach approval of landowner and attach survey of remote pit location  Well drilled below base of Detroit River Anhydrite. Describe how mud and cuttings pursuant to R324.407(7)(iv) will be handled. Pit fluids below DRA disposed by
C. IMPACTS AS A RESULT OF PRODUCTION
1. Kind of well ☐ exploratory ☐ development ☒ Other (describe) Brine Disposal
Antrim project (submit separate project EIA, form EQP 7200-21, for access roads, flow lines, and surface facilities) where is project EIA found? and complete C-2, omit C-3 and C-4
2. Location of surface facilities (Prior to construction, the District Geologist, pursuant to R324.1002, must also approve all surface facility secondary containment plans.)  Greater than 300' from wellhead. Identify facility location on attached plat and complete C-3 and C-4.  Less than 300' from wellhead. Identify facility location on attached plat, complete C-3, omit C-4.  Surface facility exists or was previously approved for construction and is known as
Sedimentation Control Plan, to District Geologist prior to construction pursuant to R324.504.  3. Flow Line Environmental Impact Assessment    Identify flow line location and course from well to the surface facility on attached plat.   Flow line route dimensionsfeet xfeet / 43,560 = acres.   Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover and present land use along the flow line route
4. Surface Facility Environmental Impact Assessment  a. Dimensions of surface facilityfeet xfeet / 43,560 =acres.  b. Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover, and present land use 1. Along access route to surface facility

Part C-4, continued
2. At surface facility site
and the same state of the same
c. Are surface facilities likely to receive oil or gas with H₂S concentration greater than 300 ppm? ☐ Yes ☐ No, if yes, R324.1106(2)
applies.
d. Will surface facilities be located in residentially zoned area?
e. Identify the distance and direction to all of the following, and identify on attached plat
1. Distance and direction to all buildings, fresh water wells, public roads, power lines and other man-made features within 600' of
surface facility
Surface (admity
2. Distance and direction to any surface waters, floodplains, wetlands, natural rivers, critical dune areas, and threatened or endangered
species within 1320' and Great Lakes shorelines within 1500' of the surface facility site
<b>,</b>
3. Describe the actions to be taken to mitigate impacts to any of the items identified in Part C-4e 1 and 2 above.
4. Distance and direction to all Type I and Type IIa public water supply wells within 2000' of the surface facility site and all Type IIb and
Type III wells within 800' of the surface facility
Type I is a community water supply with year-round service ≥ 15 living units or ≥ 25 residents. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25
individuals for not less than 60 days per year. Average daily water production: IIA ≥ 20,000 GPD IIB <20,000 GPD Type III is a public water supply which is neither type I or II.
5. Method of brine disposal
☐ Dedicated flow line to disposal well, permit number
☐ Transported by tanker. ☑ Other <u>Injection well</u>
6. Method of transporting hydrocarbons past the point of sale
Con cold through transmission line
☐ Oil sold through transmission line ☐ Gas sold through transmission line
☐ Oil transported by tanker for sale ☐ Gas flared on site (production restrictions may apply)
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LOCATION: 2459' FEET FROM THE SOUTH LINE AND 1122 FEET FROM THE WEST LINE OF SECTION 9, T4S, R2E, NORVELL TOWNSHIP, JACKSON COUNTY, MICHIGAN.

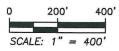
761' 291' N46°E 682' S32E

C/L CREEK EDGE OF MARSH EDGE OF MARSH EDGE OF MARSH

91' N81 E 530' 171' N30°E S86E

HAYSTEAD 1-9/1-9A WELL NORVELL 9 CTB HAYSTEAD 3-9 WELL







## WESTSHORE CONSULTING

Engineers = Scientists = Surveyors = Planners

www.WestshoreConsulting.com

2534 Black Creek Road Muskegon, MI 49444 (231) 777-3447

250B Washington Avenue Grand Haven, MI 49417 (616) 844–1260

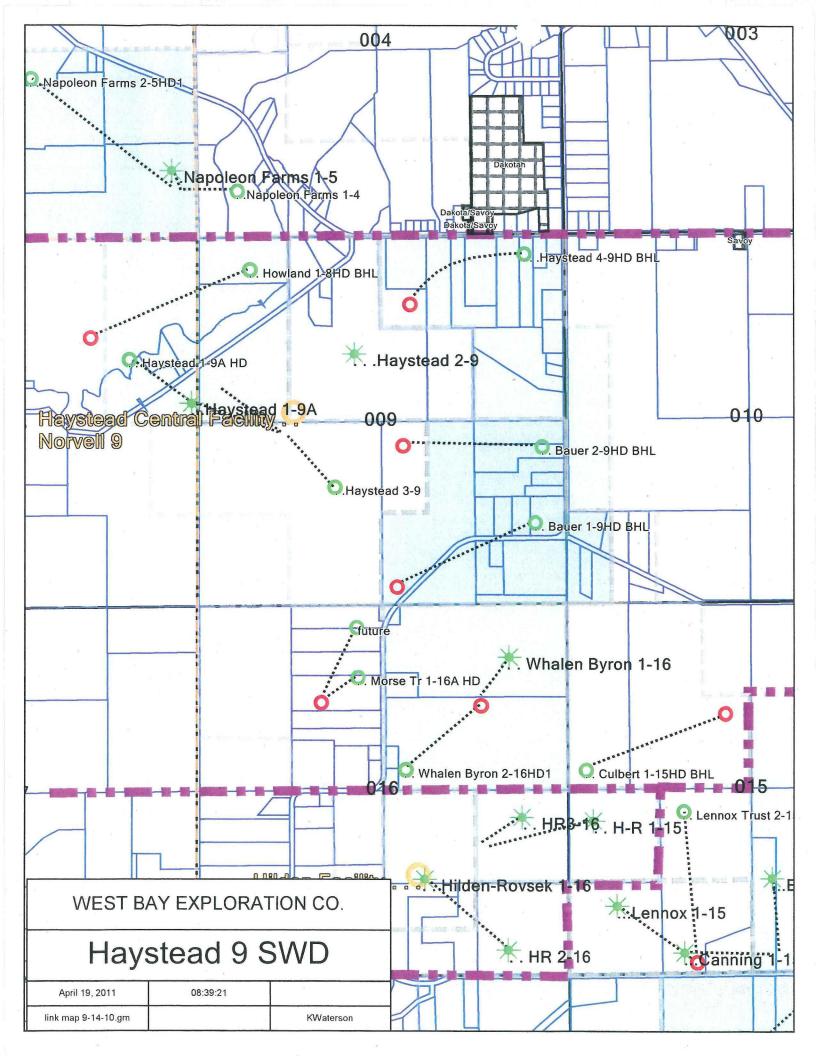
P.O. Box 7 Manistee, MI 49660 (231) 920-5818

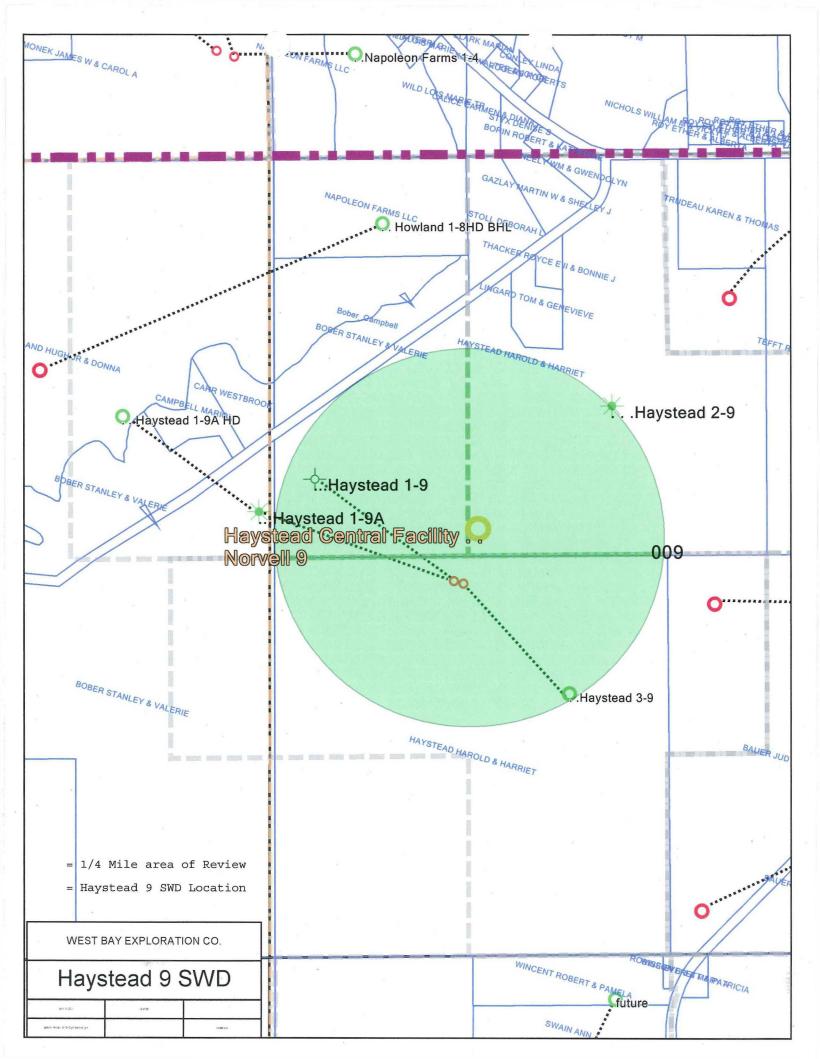
#### WEST BAY EXPLORATION COMPANY

13685 South West Bay Shore Dr. Traverse City, Mi. 49684

SURVEY OF THE HAYSTEAD 9 SWD WELL LOCATED IN SECTION 9, T4S, R2E, NORVELL TWP, JACKSON CO.

Checked:	SW
Date:	3/16/11
Drawn by:	WAV
Date:	3/16/11
File No.:	323-130
Figure:	





DEST		IN DEPAR		KONIVIENTAL Q			LOGICAL S				
APPL	ICATION FO	R PERN	TO:	1a. Part 615 S		1	Part 625 Mir		10.	ee encl	osed
DRILL DEEPEN CONVERT						-	Vaste Dispo		∣⊠Y		
AND ODEDATE A MELL									o, revis	ion of	
	Part 615 or Part 625 of A			Hydrocarbo	255		rocessed b	rine dispos		cation	
Non-submission and/or falsification of this information							torage		_ UN	o, leg o	f horz
	nay result in fines and/o			Recovery			est, fee sch			drainho	
2. List all previ	ious permit numbers			D. No. (do not u	ise SSN)		ate well and		ling unit o		n plat
			38-234				RTH LINE, SECTION 9,	145 R2E	AOSTIN	ND.	=j
4. Conformand		Attached	6. Bond num	ber	7. Bond a			Mark 1			
⊠ Blanket □	Single well	⊠On file	08784181		250,000	) ] ]	LE SE	1/2	1/2		
8. Applicant (n	ame of permittee as	bonded)				S, R2	PALERE	300	777		
West Bay Exi	ploration Compa	nv			*	17.	AFFER TO	SEC 9	PROP	ERTY DARY	RZE D.
9. Address		-		Phone				JLU 3	, 77,77		IAS.
A Company of the Comp	West Bay Shore	Drive		(231) 946	2000	INE. SECTION	/8/2		777		성 성 성
Suite 200	vvcot bay onore	Dillo			DEQ 4 addition	acl days	1122'	1496'	AST-WEST 1/	4 LINE	SECTIO
	MI 40604				his application			NA MA			NE.
Traverse City	, IVII 49084				riis application			/4 [		***************************************	la la
							.69				EA
	ell name (be as brief	as possible)		Well num	ber	1111	24	17777-1-SO			4
Haystead	I			9 SWD				NORT	5//		
11. Surface own	ner							TIME TO THE TOTAL THE TOTAL TO THE TOTAL TOT	%		
Harold and F	larriet Haystead					822	SOUTH LINE, SECTION	9, T4S, R2E	·		
12. Surface loca						Townsh	р		County		
NE 1/4	of NW 1/4	of SW	1/4 of Sec	9 T4S	R2E	Norvel		400	Jackso	n	
13. If directiona	I, bottom hole location	on				Townsh	р		County		
	l of 1/4		1/4 of Sec	T	R		70				
14. The surface	location for this wel	lis	*								
2459	feet from near	est (N/S) S	section	n line A	ND 1122	feet from n	earest (E/W	) <u>W</u>	sect	ion line	
15. Is this a dire	ectional well? X No	Yes	If yes, complet	te line15. The b	ottom hole loc	ation for this v	vell is				
	feet from near		section		ND			)	sec	ion line	
16. The bottom	hole location (wheth	er straight or o	directional) of t								
	feet from near	est (N/S)	drilling	unit line A	ND	feet from n	earest (E/M	()	drilli	ng unit	line
17. Kind of tools			Is sour oil or g			19. Base of					
	able Combinatio			☐ H <sub>2</sub> S Cont. p	lan enclosed					th 200	)+/-
20. Intended to			Formation at t		22. Producing						
MD 3100'	TVD	A CONTRACTOR OF THE PROPERTY O	lina A1/Niag		Salina A1/			apoleon			Ojeci
	170							ароксоп	71401461		
24.	HOLE	PROPOSED	DRILLING, CA	ASING AND CE		ID SEALING		SEASENIT	-	1 5.01	15
	HOLE	1 n:: n:	0.5.0:	CASI		I 5 (1 (8 45)	()	EMENT	14400	ML	
Depth (MD)	Geol. Formation			Wt/Ft Grade	Condition	Depth (MD)	Sacks	1.O.C.		-	-
350'	Shales	14 3/4"	11 3/4"	42#/ft H-4	10 New	350'	335	Surf	12	8.4	50+
900'	Coldwater Sh	10 5/8"	8 5/8"	24#/ft J-5	55 New	930'	220	Surf	12	8.5	40+
2870'	G-Unit/C-Shale	7 7/8"	5 ½"	15.5#/ft J-	55 New	2870'	450	Surf	24	9.7	28+
3100'	Niagaran	7 7/8"	N/A	Open	Hole	3100'	_	20.00		9.7	28+
3100	Magaran	1 110	INA	Open	11016	3100	<b></b>			9.1	201
	ATAITING DOGGE	10011101	444 05145117		DITI\( (EQ. 4)						
	MENTING PROGRA					VOLUMES	IN CU. FT.	FOR EA	CH CASI	NG STE	ING.
Surface AV=15	3 cu ft-335 sx C	lass A w/2%	6 CaCl, (1.1	8 yield) ceme	ent to surf						
Intermediate AV	/=238 cu ft- 55 s:	x 50/50 PO	Z w/2% Car	CI2, (1.56 yie	ld), Tail 165	sx Class A	w/2% Ca	aCI-Cen	ent to	Surf	
	tion AV=568 cu ft										
Name and Address of the Owner o			OX 00/00 1 V	OL WIL 10 OU	51 (1.00 yiel	a), 200 0X (	2011 (1.10	yicia) O	official t	o Ouri	
Decreosing to appropriate control of the control of	spondence and perm				E 1111	Sls = = = = 4					9 0
	y Exploration Com		0 '' 000 T	0:1 14		@wbeco.net		041 040	0000		
Address <u>13685</u>	South West Bay S	Shore Drive,	Suite 200, Tr	averse City, M	1 49684		Phone (2	231) 946-	0200		
	N "I state that I am a					nit fee of \$300					
	prepared under my s					al well; or \$50					
	accurate and comple			ge."		torage well. I	/lake checks	payable	to State of	of Michig	gan.
	prepared by (print or	type)	Phone		DEQ Cashie	r use only.					
Ann M Baker	2 1		(231) 94	16-0200	1						
28. Signature	100		Date				12				
11/1	1111511		4/27/20	11							
	Office of Geolo	gical Survey L	Jse Only		1						9
Permit number	API number			Owner number	1						
9											
	5/2007) SEE IN	ISTRUCTIONS	S FOR MAILIN	IG ON REVERS	J E						
EQP 7200-1 (rev	. 3/2007) 3EE II		O I OIL INVITEDIA	IO OIA IVE AFIVE	-						



# **Central Michigan Cementing Services**

1934 Commercial Drive • Mt. Pleasant, MI USA 48858 Phone: 989/775-0940 • Fax: 989/773-0943 midstatetools@msn.com

#### FIELD PLUGGING SUMMARY

WELL NAME Hay STEED 10 STATE 101 TWP. Not yell T  CONTRACTORS NAME (Pag Scarzeight  JOB DESCRIPTION Plug 13cck / Kick plug  PLUG TO ABANDON PLUG # PLUG # PLUG # PLUG # PLUG # PLUG #  SIZE OF PIPE IN HOLE 7/2 7/2 8/4  CALCULATED TOP OF PLUG FT. 3798 3169  DEPTH TO BOTTOM OF PLUG FT. 4/2/1 3600  SACKS OF CEMENT USED 120 125  SULURRY VOLLIME USED BBLS 25.1 26.2  TYPE OF CEMENT USED A A 3/2.  AVER, SLURRY WILLB/GAL 15.6 15.6  TYPE OF FILL IN HOLE 9/1/1 1/3 1  SIZE OF TUBING USED BBL. 1/5 36  TUBING VOLLIME DISP BBL. 1/5 36  SOUEZE DATA DEPTH OF SOUEZE ENTRY  NO. OF SACKS SOUEZED MAX PSI OF SOUEZE ENTRY  PROCEDURE USED BAL 1/5 36  PROCEDURE USED BAL 1/5 36  TOTAL MATERIAL USED 245 SECTION TO ALL ALL ALL ALL ALL ALL ALL ALL ALL AL	COMPANY West Bay		n		DATE 6-1	-10	IOB #
COUNTY Jeckson STATE M, TWP Norvell T  CONTRACTORS NAME (				2000	NO	1-9	
PLUG TO ABANDON PLUG #  SIZE OF PIPE IN HOLE 7 /2 7/8 8/4  CALCULATED TOP OF PLUG FT. 37 98 31 6 9  DEPTH TO BOTTOM OF PLUG FT. 42 12 36 00  SACKS OF CEMENT USED 1/20 1/25  SLURRY VOLUME USED BBLS 25.2 26.2  TYPE OF CEMENT USED A A 3/2.  AVER, SLURRY WITE LISTAL  TYPE OF SPACE USED FEET OF FILL IN HOLE 1/2 x y y y y y y y y  SIZE OF TUBING USED 1/2 x y y y y y y y  SIZE OF TUBING USED 1/2 x y y y y y y  SIZE OF TUBING USED 1/2 x y y y y y y  SOUFEZE DATA DEPTH OF SOUSEZE ENTRY  NO. OF SACKS SQUEEZED PROCEDURE USED BFORE CICCULAtion PNON AD BIRL FU Alked  MILL A PUMP 120 SS Class A Displac With 20 BBL FW and 25 BBL BROKE  TOTAL TO 36000 BFOR ACCURATION TO HARD  AT A PUMP 125 SS Class A Displac With 20 BBL FW Alked  MILL A PUMP 125 SS Class A Displac With 20 BBL FW Alked  MILL A PUMP 125 SS Class A Displac With 20 BBL FW Alked  MILL A PUMP 125 SS Class A Displac With 20 BBL FW Alked  MILL A PUMP 125 SS Class A Displac With 20 BBL FW Alked  MILL A PUMP 125 SS Class A Content  TOTAL MATERIAL USED 245 SS Class A Content  TOTAL MATERIAL USED  245 SS Class A Content  TOTAL MATERIAL USED  Calcium Chloride	•		COUNTY	Jackson	STATE	m, TWP.	Norvell Ta
PLUG TO ABANDON PLUG #  SIZE OF PIPE IN HOLE 7/2 7/8 8/4  CALCULATED TOP OF PLUG FT. 3798 3169  DEPTH TO BOTTOM OF PLUG FT. 4212 3600  SACKS OF CEMENT USED 120 125  SLURRY VOLUME USED BBLS 25.2 26.2  TYPE OF CEMENT USED A A 3/2.  AVER. SLURRY WIT, LB/GAL 15.6 15.6  TYPE OF SPACE USED FW. FW. FW.  FEET OF FILL IN HOLE 414 431  SIZE OF TUBING USED 11/2 x H 4/2 x H  TUBING VOLUME DISR BBL. 45 36  SQUEEZE DATA DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED MAX PSI OF SQUEEZE  PROCEDURE USED Break Ciculation Prop 20 BBL FW Abread  MILL PUMP 125 SX Class A Displace With 20 BBL FW Abread  MILL PUMP 125 SX Class A Displace With 20 BBL FW Abread  MILL PUMP 125 SX Class A 13%, Ceel. Displace With 20 BBL FW  and 16 BBL B17 Inc. TOH  TOTAL MATERIAL USED 245 Sx Class A correct	CONTRACTORS NAME	& Scawrigh	1				
SIZE OF PIPE IN HOLE  7/8 7/8 8/8  CALCULATED TOP OF PLUG FT. 3798 3169  DEPTH TO BOTTOM OF PLUG FT. 4212 3600  SACKS OF CEMENT USED 120 125  SLURRY VOLUME USED BBLS 25.2 26.2  TYPE OF CEMENT USED A A 3/2.  AVER. SLURRY WIT LB /GAL 15.6 15.6  TYPE OF SPÄCE USED  FET OF FILL IN HOLE 4/14 4/31  SIZE OF TUBING USED 1/2 x H 4/2 x H  TUBING VOLUME DISR BBL 1/5 36  SOUEEZE DATA  NO. OF SACKS SQUEEZED  PROCEDURE USED  Brak Ciculation Prop 20 BBL FW Abred  TOTH TO 3600 Brak Ciculation Prop 20 BBL FW Abred  MIX & Pump 125 sx Class & Displee With 20 BBL FW Abred  MIX & Pump 125 sx Class & 37, Cecl. Displee With 20 BBL FW Abred  MIX & Pump 125 sx Class & 37, Cecl. Displee With 20 BBL FW  and 16 BBL B17 inc TOH  TOTAL MATERIAL USED 245 sx Class A coment  TOTAL MATERIAL USED 245 sx Class A coment  TOTAL MATERIAL USED Class A Class A Coment  TOTAL MATERIAL USED 245 sx Class A coment	JOB DESCRIPTION Dlug	Back	/ Kick pl	vs			
SIZE OF PIPE IN HOLE  7 / 8 7 / 8 8 / 8  CALCULATED TOP OF PLUG FT. 3798 3169  DEPTH TO BOTTOM OF PLUG FT. 4212 3600  SACKS OF CEMENT USED 120 125  SLURRY VOLUME USED BBLS 25.2 26.2  TYPE OF CEMENT USED A A 3/.  AVER, SLURRY WIT LB /GAL 15.6  TYPE OF SPACE USED.  FEET OF FILL IN HOLE 4/14 4/31  SIZE OF TUBING USED 1/2 x H 4/1 x H  TUBING VOLUME DISP BBL 1/5 36  SQUEEZE DATA DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED MAX PSI OF SQUEEZE  PROCEDURE USED Break Cicculation Prop 20 BBL FW Abred  MIX & PUMP 125 SX Closs & Displace With 20 BBC FW Abred  MIX & PUMP 125 SX Closs & 37, Cecl. Displace With 20 BBC FW  and 16 BBL B17 inc TOH  TOTAL MATERIAL USED 245 Sx Closs A coment  TOTAL MATERIAL USED 245 Sx Closs A coment  TOTAL MATERIAL USED 245 Sx Closs A coment	PLUG TO ABANDON	PLUG #	PLUG #	PLUG #	PLUG#	PLUG #	PLUG #
DEPTH TO BOTTOM OF PLUG FT. 4212 3600  SACKS OF CEMENT USED 120 125  SLURRY VOLUME USED BBLS 25.2 26.2  TYPE OF CEMENT USED A A 3/.  AVER, SLURRY WILB (GAL. 15.6 15.6  TYPE OF SPACE USED FW FEET OF FILL IN HOLE 41/4 431  SIZE OF TUBING USED 4/2 x H 4/1 x H  TUBING VOLUME DISP BBL. 4/5 36  SQUEEZE DATA DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED MAX PSI OF SQUEEZE  PROCEDURE USED Break Cicculation pump 20 1381 FW Alked  Mix w pump 120 50 Class A Displace With 20 pag fw and 25 Apr Brim.  TOTH TO 3600' Brick Circulation TI. H Brine pump 20 FW Alked  Mix w pump 125 5x Class A 3/. Cecl. Displace With 20 pag fw and 25 Apr Brim.  TOTAL MATERIAL USED 245 5x Class A 3/. Cecl. Displace With 20 pag fw and 25 Apr Brim.  TOTAL MATERIAL USED 245 5x Class A coment  7 51 Colsium Chloride	SIZE OF PIPE IN HOLE	7 1/8	7/8 8/8				
SACKS OF CEMENT USED  120  SLURRY VOLUME USED BBLS  25.2  TYPE OF CEMENT USED  A 3/.  AVER, SLURRY WT. LB. (GAL.  TYPE OF SPACE USED.  FEW.  FEW.  FEW.  FEW.  TYPE OF TUBING USED  FW.  TYPE OF TUBING USED  FW.  TUBING VOLUME DISP BBL.  SQUEEZE DATA  NO. OF SACKS SQUEEZED  PROCEDURE USED  Break Circulation  MAX PSI OF SQUEEZE ENTRY  MAX PSI OF SQUEEZE  PROCEDURE USED  Break Circulation  TOTAL TO 3600'  Break Circulation  TOTAL MATERIAL USED  245 5x Class A 37, Cecl.  Displace With 20 BBL With 20 BBL FW  And b BBL Break  TOTAL MATERIAL USED  245 5x Class A correct  TOTAL MATERIAL USED  245 5x Class A correct  TOTAL MATERIAL USED  Coleium Chloride	CALCULATED TOP OF PLUG FT.	3798	3169				
SLURRY VOLUME USED BLS  TYPE OF CEMENT USED  A 3 1/2.  AVER. SLURRY WT. LB /GAL.  TYPE OF SPACE USED.  FW.  FW.  FW.  FW.  FW.  FW.  FW.  F	DEPTH TO BOTTOM OF PLUG FT.	4212	3600				
TYPE OF CEMENT USED  A A 3 /.  AVER SLURRY WIT LB /GAL  I S. & 15.	SACKS OF CEMENT USED	120	125				
AVER SLURRY WT. LB/GAL. 15.6 15.6  TYPE OF SPACE USED  FEET OF FILL IN HOLE  SIZE OF TUBING USED  11/2 x H  11/2 x H  11/3 x H  11/4 x H  TUBING VOLUME DISP BBL.  SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED  MAX PSI OF SQUEEZE  PROCEDURE USED  Break Circulation pump 20 BBL FW Althout  Mil w pump 120 SI Class A Display With 20 BBL FW and 25 BBL BRING  TON TO 3600° BSP. K Circulation TI'll Bride pump 20 FW Althout  MIN w pump 125 SX Class A 37. Cecls Display With 20 BBL FW  and 16 BBL B17 inc TOH  TOTAL MATERIAL USED  245 Sx Class A comient  7 SI Coteium Chloride	SLURRY VOLUME USED BBLS	25.2	26.2				
TOTAL MATERIAL USED  TOPE OF SPACE USED  SET OF FILL IN HOLE  414  431  SIZE OF TUBING USED  1/2 x H 4/1 x H  1/2 x H 4/1 x H  1/3 x H  1/3 x H  1/4 x H  1/	TYPE OF CEMENT USED	A	A 3%.			1	
SCUEEZE DATA  NO. OF SACKS SQUEEZED  PROCEDURE USED  Break Ciculation  Pump 120 St Class A Displace With 20 BBC FW and 25 ABC BRIDE  TOTAL MATERIAL USED  245 St Class A Centent  TOTAL MATERIAL USED  SIZE OF TUBING USED  1/2 x H 4//2 x H  1/3 x H  1/4 x H  1/5 36  DEPTH OF SQUEEZE ENTRY  MAX PSI OF SQUEEZE ENTRY  MAX PSI OF SQUEEZE  PROCEDURE USED  Break Ciculation  Pump 20 BBC FW and 25 ABC BRIDE  TOTAL TO 36000 Break Ciculation  TITAL Bride Pump 20 BBC FW  And 16 BBC BITING  TOH  TOTAL MATERIAL USED  245 St Class A Centent  TOTAL MATERIAL USED  Coleium Chloride	AVER. SLURRY WT. LB./GAL.	15.6	15.6				- La
SCUEEZE DATA  NO. OF SACKS SQUEEZED  PROCEDURE USED  Break Ciculation  Pump 120 St Class A Displace With 20 BBC FW and 25 ABC BRIDE  TOTAL MATERIAL USED  245 St Class A Centent  TOTAL MATERIAL USED  SIZE OF TUBING USED  1/2 x H 4//2 x H  1/3 x H  1/4 x H  1/5 36  DEPTH OF SQUEEZE ENTRY  MAX PSI OF SQUEEZE ENTRY  MAX PSI OF SQUEEZE  PROCEDURE USED  Break Ciculation  Pump 20 BBC FW and 25 ABC BRIDE  TOTAL TO 36000 Break Ciculation  TITAL Bride Pump 20 BBC FW  And 16 BBC BITING  TOH  TOTAL MATERIAL USED  245 St Class A Centent  TOTAL MATERIAL USED  Coleium Chloride	TYPE OF SPACE USED	FW	FW				
TUBING VOLUME DISP BBL.  45  36  SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED  PROCEDURE USED  Break Circulation Pump 20 BBL FW Alterd  Mix w pump 120 sx Class A Displace With 20 BBC FW and 25 BBC BRine  TON TO 3600° Break Circulation TITE Brine Pump 20 FW Alterd  Mix w pump 125 sx Class A 13% Cocle Displace With 20 BBC FW  and 16 BBL BRine  TOH  TOTAL MATERIAL USED  245 5x Class A Coment  7 58 Coleium Chloride		414	431				
SQUEEZE DATA  DEPTH OF SQUEEZE ENTRY  NO. OF SACKS SQUEEZED  PROCEDURE USED  Break Ciculation pump 20 BBL FW Alked  MILL DUMP 120 St Class A Displace With 20 BBC FW and 25 BBC BRIDE  TON TO 3600' Brick Circulation TITE Bride DUMP 20 BBL FW  MILL DUMP 125 SX Class A 13% Cocl. Displace With 20 BBL FW  and 16 BBL BRIDE  TOTAL MATERIAL USED  245 SX Class A Coment  Total Material USED  245 SX Class A Coment	SIZE OF TUBING USED	41/2 xH	41/2 XH				
NO. OF SACKS SQUEEZED  PROCEDURE USED Break Circulation pump 20 BBL FW Attack  Mix w pump 120 sx Class A Displece With 20 BBC FW and 25 BBC BRine  TON TO 3600" Break Circulation With Brine pump 10 FW Attack  Mix w pump 125 sx Class A 134. Cocl. Displece With 20 BBC FW  and 16 BBL Birine TOH  TOTAL MATERIAL USED  245 Sx Class A Coment  7 St Colsium Chloride	TUBING VOLUME DISP. BBL.	45	36				
PUMP # 438 BULK # 908  CEMENTER 13.11 PUSSEII	NO. OF SACKS SQUEEZED  PROCEDURE USED  MIX N PUMP 120  MIX N PUMP 125  and 16 13 BL 13 15  TOTAL MATERIAL USED  DATE OF JOB COMPLETED  PUMP # 438  CEMENTER 13,11 RUSSE	245 Sx 7 Sx	Class A	MAX PSI OF S  BRIL FW  With 20 B  TITH 1  el, Disp  Coment  Chlorida  TICKET NO.	SQUEEZE  Alkad  BELAC DO  SLUCC WILL	15 10 F	W Alked
COMMENTS	COMMENTS						
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## **Daily Drilling Report**

West Bay Exploration

		THE RESERVE OF THE PARTY OF THE		ation			W. C. T. T. C. C. C.	
Н	laystead 1-	9		Date:	6/2/20	10	Day:	14
	AES Rig # 2		E	levations:	954.5	4'	Table:	966.26'
8 5/8	" 32 # J-55	3340'		Weather:	67 De	g	RF:	966.26'
lug Back D	epth 3600'	Thru 3340'	7ar	n Activity:	Wait On Co	ement	KB:	967.26
	Clinton			Footage:	0		Spud Date:	5/20/201
								3:00 AM
Costs				Chronolog	gical Report			
		8						
	07.00 - 08.	30 Log Hol	e With Baker	/Atlas				
\$11,500	08.30 - 11.	30 TIH						
	11.30 - 13.	00 Circ Hol	e, WOO				×	
\$0	13.00 - 17.	00 Wait Or	ո Cement Tru	ıcks	ä			
				W/120 sk	s Class A Cem	ent		
\$2,116	17.30 - 18.	30 TOOH T	o 3600'					
\$6,898	18.30 - 19.	30 Set Kick	Plug At 3600	D' W/125 s	ks Class A 3%c	cc		
\$0	19.30 - 21.	00 TOOH V	Vith HWY Pip	e				
\$2,180	21.00 - 23.	00 TOOH L	aying Down	Drill String				
\$0	23.00 - 07.	00 WOC, T	rip Check HV	VY Pipe, Ch	eck, Monels, S	ubs,Colla	rs,Kelly, 1 Ba	d Collar
\$23,724								
			*					
\$850								
\$0	B.W.:	0	Str Wt:	0	RPMs:	(	P.P.#:	0
	Pui	np:	Line	r:	Stroke	s:	GPM:	Total GPM
	Ideco N	лм 550	6'	•	62		368	368
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\$0			, KOL	370				8
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\$72,493			1				Total Hrs.	24
							Total Tills.	
	Grade			Casing Ir	formation			
sts		Cea Sizo:		Casing Ir	nformation Supplier:			
<u>sts</u> \$51,663		Csg Size:		Casing Ir	Supplier:			
sts \$51,663 \$616,852		Tallied Ft.:		Casing Ir	Supplier: Tallied Jts:		_	
\$51,663 \$51,852 \$616,852 \$668,515		Tallied Ft.: Ft. Ran:			Supplier: Tallied Jts: Jts. Ran:		- -	
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\$51,663 \$51,852 \$616,852 \$668,515	Ft. T	Tallied Ft.: Ft. Ran: ransferred: Ft. Left:			Supplier: Tallied Jts: Jts. Ran:			
\$51,663 \$51,663 \$616,852 \$668,515	Ft. T	Tallied Ft.: Ft. Ran: ransferred:			Supplier: Tallied Jts: Jts. Ran: _ Transferred _		-	
\$51,663 \$51,663 \$616,852 \$668,515	Ft. T	Tallied Ft.: Ft. Ran: ransferred: Ft. Left:			Supplier: Tallied Jts: Jts. Ran: _ Transferred _		-	
\$51,663 \$51,663 \$616,852 \$668,515	Ft. T	Tallied Ft.: Ft. Ran: ransferred: Ft. Left:			Supplier: Tallied Jts: Jts. Ran: _ Transferred _		-	
	\$11,500 \$0 \$2,116 \$6,898 \$0 \$2,180 \$0 \$23,724 \$850 \$0 \$4,395 \$1,663 \$529,829 \$581,492 \$5,700 \$13,545 \$53,248	07.00 - 08. \$11,500	07.00 - 08.30 Log Hol \$11,500 08.30 - 11.30 TIH 11.30 - 13.00 Circ Hol \$0 13.00 - 17.00 Wait Or 17.00 - 17.30 Set 1st \$2,116 17.30 - 18.30 TOOH T \$6,898 18.30 - 19.30 Set Kick \$0 19.30 - 21.00 TOOH V \$2,180 21.00 - 23.00 TOOH L \$0 23.00 - 07.00 WOC, T \$23,724  \$850 \$0 B.W.: 0 Pump: Ideco MM 550 \$4,395 Cont Emsco DB 550 \$.H.T. \$0 \$51,663 Bit No. \$529,829 Size \$581,492 Make Type \$5,700 S/N \$13,545 Noz \$53,248 In @ Out @	07.00 - 08.30   Log Hole With Baker   \$11,500   08.30 - 11.30   TIH   11.30 - 13.00   Circ Hole, WOO   \$0   13.00 - 17.00   Wait On Cement True   17.00 - 17.30   Set 1st Plug At 4200   \$2,116   17.30 - 18.30   TOOH To 3600   \$6,898   18.30 - 19.30   Set Kick Plug At 3600   \$0   19.30 - 21.00   TOOH With HWY Pip   \$2,180   21.00 - 23.00   TOOH Laying Down   \$0   23.00 - 07.00   WOC, Trip Check HW   \$23,724   \$850   Shw.: 0   Str Wt:   Pump:   Line   Ideco MM 550   6   \$4,395   Cont Emsco DB 550   5.5   Sh.H.T.	O7.00 - 08.30   Log Hole With Baker/Atlas	O7.00 - 08.30   Log Hole With Baker/Atlas	Costs   Chronological Report	Costs

#### MICHIGAN DEPAR ....ENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

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	uthority of Part	-				The same of the sa			Permi	t numbe	r/Deepe	ning	numbe	er	
amended. No	n-submission a	and/or falsific	cation of thi	s information	n may result in			ent.	6010	6					
10.1	7/ B 2	ant on a	£ 1 700		3	API number									
(Sub	mit 3 copies w	vimin 60 da	ys of drivin	ig completi	on.)	21-075-60 Well name a									
	rt 615 Oil/Ga		Part 62	5 Mineral	Well	Haystead Surface loca			~						
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	ity, MI 4968		<b>3</b> 0			Norvell				Jackso	N92				
Havelse U	alv. 1911 4500	7				Footages	Nort	h/South	1	Jackst		st/M	lest		
Name and ad-	dress of drilling	contractor				2472 ft	from Sou	ith line :	and 12	12 ñ	from V	Mes	t line	ofsec	
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Homer, MI						Subsurface	location (if	directiona	lly drille	ed)					
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Date drilling b	pegan	] [	Date drilling	completed		Township				Count	У				
5/20/10			6/28/10			Columbia				Jack					
Total depth of		. ] f	Formation a	t total depth		Footages	Nort	h/South			Ea	ast/V	Vest		
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	nation			To 4589m	Form		ther Oil an Oil or	d Gas Sho	San	A	or Log Vhere C	ged Obse	rved (X Mud	) Gas	Fill
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Trenton-B	nation R	Oil or Gas Oil	From 4400m	4589m	Form:	etion	Oil or		San	n-	Where C	bse	Mud	Gas	
Trenton-B	nation R	Oil or Gas Oil	From 4400m	4589m		etion	Oil or		San	n-	Where C	bse	Mud	Gas	
Trenton-B	nation R	Oil or Gas Oil	From 4400m	4589m		etion	Oil or		San	n-	Where C	bse	Mud	Gas	
Trenton-B	nation R R	Oil or Gas Oil Oil	From 4400m	4589m	not observ	etion red	Oil or		San	V n- s Odi	Where O	bse	Mud Lîne	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or Gas	Depth	San	V n- Odi	Where C	its	Mud Lîne	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or		San	V n- s Odi	Where O	its	Mud Lîne	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or Gas	Depth	San	V n- Odi	Where O	its Bar	Mud Line Line	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or Gas	Depth	San	V n- Odi	Where O	its Bar	Mud Line Line	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or Gas	Depth	San	V n- Odi	Where O	its Bar	Mud Line	Gas	
Trenton-B	nation R R Depth Cor	Oil or Gas Oil Oil	4400m 4166tv	4589m 4348tv	not observ	etion /ed Ion Survey	Oil or Gas	Depth	San	V n- Odi	Where O	I Bac	Mud Line	Gas	
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Department	Depth Corpth  Brand as	Oil or Gas Oil Oil rection Corre	From 4400m 4166tv  ction  CNL  crimation rethonized by	4589m 4348tv  Geophys  Density/G  cord, coring said owner.	Deviat Run at  Tical / Mechan Log types Record, and de	it stem test i	Oil or Gas Degrees	Pepth Ye e run) surf-455	Sam ple s N	P Logg	Plugged retion  Mail  ed inter	I Baro	Mud Line Ck Depth	Gas	Up
De D	Depth Corpth  Brand as  ATION "I state ind complete to it"	Oil or Gas Oil Oil rection Corre	From 4400m 4166tv  ection  CNL  crimation reithorized by my knowled	4589m 4348tv  Geophys  Density/G  cord, coring said owner.	Deviat Run at  Tical / Mechan Log types Record, and de	it stem test i	Oil or Gas Degrees St each type	Pepth Ye  Ye  on reverse supervision	Sam ples	Volume to the second of the se	Plugged retion  Mail  ed inter	I Baro	Mud Line Ck Depth	Gas	Up
Trenton-Bi Trenton-Bi Trenton-Bi Deposition	Depth Corpth  Brand as  ATION "I state indicomplete to it	Oil or Gas Oil Oil rection Come	From 4400m 4166tv  ction  CNL  crimation re- thorized by ny knowled- title (print)	4589m 4348tv  Geophys  Density/G  cord, coring said owner.	Deviat Run at  Tical / Mechan Log types R record, and dr	it stem test i	Oil or Gas Degrees St each type	Pepth Ye e run) surf-455	Sam ples	P Logg	Plugged retion  Mail  ed inter	I Baro	Mud Line Ck Depth	Gas	Up

EQP 7200-5 (rev. 8/2004)

PO BOX 30256, LANSING, MI 48909-7756

### FORMATION RECORD

Attach additional sheets if necessary

API number
21.015 GOLTHE CT 30

Permit number/Deepening number 60076

Elevation used 967.26

Geologist name

Trish Rising, West Bay Exploration

Tops taken from

Driller's log

Sample log

⊠ Electric log

967.26	Trish	Rising, West Bay Exploration	Driller's log	Sample log	
***		Formation	4		Tomovio
From	То	(type, color, hardness)	From	To	Formation (type, color, hardness)
			11011	10	Tope, color, naturess)
lote: If well there approp		ed, add true vertical depth formation tops	CL-Committee Committee Com		· ·
OP	3787md	Clinton Fm	- Company		
375md	3583tvd	dolomite with shaley intervals-drk			
· Control Control		gray grading to It gry, brn, dns			
3787md	4127md 3911tvd	Utica Fm shale-drk gry/blk, vfxln, hrd	,		
3583tvd 1127md	4478md	Trenton Fm			
3911tvd	4243tvd	dolomite and limestone, lt/drk brn,			
		vfxln, mhd, cln, scat fossils/pyr			
4478md	4555md	Black River Fm			
4243tvd	4317tvd	timestone and dolomite-md drk brn, arg, wh/off wh dol, mhd, arg			
	PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PR	ang, whom with aco, three, ang			
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	-		Sections		
		*	If well w	was cored, attach core	description
				DRILL STEM TEST D.	ATA
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			all and the second	Onerati	ons Office
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	and the common of the common o		OFFICE O	F GEOLOGICAL SUR	VEV HOE ON!! V

Date of review

Operations Office

OCT 2 7 2010

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#### Des

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended

# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY CERTIFICATION OF CASING AND SEALING OF SURFACE HOLE

Permit number 60106

Non-summiss may r	esult in fines and/or in	Thus outline in	Housete	ead 1-9A				
ownship	Cou	ntv		location		· · · · · · · · · · · · · · · · · · ·		
Vorvell		kson			F SIMAIN Continu D	T4S F	? 2E	
lame and address of pe		NSUII		NE 1/4 of NW 1/4 of SW1/4 Section 9 T 4S R 2E Name and address of drilling contractor				
			1		mig sondagotor			
microscopic commence de la commence del la commence de la commence								
-			1 0 000 0		*			
raverse City, MI 4	9684		Home	r, MI 49254				
West Bay Exploration 13685 S. West Bay Shore Dr #200 Traverse City, MI 49684  SURFACE HOLE  Hole diameter Depth to Base of specified aquifer (see permit) 14 3/4  88 Marshall 425  Coldwater Shale 6/28/10  Narrative of unusual drilling circumstances or problems encountered none  Name and address of geologist/mud logger Trish Rising, Field Geologist West Bay Exploration 12180 Ladd Rd Brooklyn, MI 49230								
Hole diameter	Depth to	Base of spe			Formation at	Date dri	lling	
	1					1		
4 3/4	100	Maioriali	420		Contiwater Strate	0120110		
inh leggrand to enternal	lling circumstances o	r problems encountered		- Iw				
	mang Concommandinees o	problemb cheoditelet	4					
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Trish Rising, Field	Geologist		×			;		
Trish Rising, Field	Geologist	~.						
Trish Rising, Field West Bay Explorat	Geologist	м,	· ·					
Trish Rising, Field West Bay Explorat 12180 Ladd Rd	Geologist	-				r		
rrish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, Ml	Geologist							
rrish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, Ml 19230	Geologist		·		Date			
rrish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, Ml	Geologist				Date	,		
Frish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI 19230 Signature	Geologist ion					)		
rish Rising, Field West Bay Explorat 2180 Ladd Rd Brooklyn, MI 19230 Signature	Geologist				Date 10 Ru 10	)		
Frish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI 19230 Signature	Geologist ion		SUPFACE CASI	Na		)		
Frish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature	Geologist ion	Cement type		wa	10 26. 18		ı down	
rish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature	Geologist ion  Casing	Cement type and additives	Amount of		10 AL 10	Plug	down	
Crish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in)	Geologist ion  Casing depth	and additives	Amount of cement (sacks	) Pump	10 S.(. 10 Volume (bbls) ed   Returned to s	Plug urface date	& fime	
Crish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in)	Geologist ion  Casing	and additives Lite	Amount of cement (sacks		10 AL 10	Plug	& fime	
Trish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in)	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s	Plug urface date	& fime	
rish Rising, Field West Bay Explorat 2180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in)  Namative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug urface date 5/21/10	& fime	
rish Rising, Field West Bay Explorat 2180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in)  Namative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug urface date 5/21/10	& fime	
rish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in) I1 3/4 Narrative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug urface date	& fime	
rish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in) I1 3/4 Narrative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug date 5/21/10	& fime	
rish Rising, Field West Bay Explorat 2180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in)  Namative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug urface date 5/21/10	& fime	
Crish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in) I1 3/4 Narrative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones.	Plug date 5/21/10	& fime	
Crish Rising, Field West Bay Explorat I2180 Ladd Rd Brooklyn, MI I9230 Signature  Casing O.D. (in) I1 3/4 Narrative of problems	Geologist ion Casing depth	and additives Lite class A	Amount of cement (sacks	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones. Operation	Plug date 5/21/10 ons Office 2 7 2010	& fime	
rish Rising, Field Vest Bay Explorat 2180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in)  In 3/4  Variative of problems	Geologist ion Casing depth 425 encountered running	and additives Lite class A or cementing casing. N	Amount of cement (sacks 135 150 Note any cement fa	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones. Operation	plug date 5/21/10 ons Office 2 7 2010 sailed	& fime	
Trish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in) 11 3/4  Narrative of problems in one	Geologist ion  Casing depth  425 encountered running	and additives Lite class A or cementing casing. N	Amount of cement (sacks 135 150 Note any cement fa	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones. Operation	plug date 5/21/10 ons Office 2 7 2010 sailed	& fime	
Trish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, MI 49230 Signature  Casing O.D. (in)	Geologist ion  Casing depth  425 encountered running	and additives Lite class A or cementing casing. N	Amount of cement (sacks 135 150 Note any cement fa	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones. Operation OCT PLETE AND CORRECT Date	plug date 5/21/10 ons Office 2 7 2010 sailed	& fime	
Trish Rising, Field West Bay Explorat 12180 Ladd Rd Brooklyn, MI 19230 Signature  Casing O.D. (in) 11 3/4  Narrative of problems in one	Geologist ion  Casing depth  425 encountered running	and additives Lite class A or cementing casing. N	Amount of cement (sacks 135 150 Note any cement fa	Pump 47,5	Volume (bbls) ed Returned to s 40 r lost circulation zones. Operation	Plug date 5/21/10 pms Office 2 7 2010 pailed	& fime	

MICHIGAN DEPT OF ENVIRONMENTAL QUALITY

PO BOX 30256

LANSING MI 48909-7756

EQP 7200-12 (rev. 8/2004)

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

#### CERTIFICATION OF CASING AND SEALING OF SURFACE HOLE

Required by au	thority of Part 615 Supervisor of Wells or	Permit number
	al Wells, of Act 451 PA 1994, as amended	60076
	on and/or falsification of this information sult in fines and/or imprisonment	Well name
illay ie	suit in titles and/or imprisonment	Haystead 1-9
Township	County	Surface location
Norvell	Jackson	Ne 1/4 of NW 1/4 of SW1/4 Section 9 T4S R 2E
Name and address of pe	rmittee	Name and address of drilling contractor
West Bay Exploration	on	Advanced Energy Services
13685 S. West Bay	Shore Dr #200	PO Box 85
Traverse City, MI 49	9684	S. Boardman, MI 49680
1 Y x y		

#### **SURFACE HOLE**

Depth to bedrock	Base of specified aquifer (see permit)	Total depth of surface hole	Formation at surface casing seat	Date drilling completed
88	Marshall	425	Coldwater Shale	6/7/10
	bedrock	bedrock aquifer (see permit)	bedrock aquifer (see permit) surface hole	bedrock aquifer (see permit) surface hole surface casing seat

none

Name and address of geologist/mud logger

Trish Rising, Field Geolgist 12180 Ladd Rd

Brooklyn, MI

49230

Signature

Date

10/19/10

#### SURFACE CASING

Casing	Casing	Cement type	Amount of	Volu	me (bbls)	Plug down
O.D. (in)	depth	and additives	cement (sacks)	Pumped	Returned to surface	date & time
11 3/4	425	Lite	175		40Bbls	10am 5/20/10
		Class A	150			

Narrative of problems encountered running or cementing casing. Note any cement fallback, grouting, or lost circulation zones.

none

Dunmelone Office

101 / 100

#### I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

ignature o	f permittee	or company	officer
------------	-------------	------------	---------

Submit the original and one copy, typewritten or legible printed, within 30 days after drilling is completed to:

OFFICE OF GEOLOGICAL SURVEY

MICHIGAN DEPT OF ENVIRONMENTAL QUALITY

PO BOX 30256

LANSING MI 48909-7756

EQP 7200-12 (rev. 8/2004)

## DES

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

#### RECORD OF WELL COMPLETION

By authority o	f Part 615 or Pa	art 625 of Ac	t 451 PA 1994,		Permit number/deepening permit no. API number 60076 21-075-60076-00-00							
as amended.	Non-submission	n and/or fals	sification of this		Type of we	ell (after o	complet	ion)	21-010-01	0010-0	0-00	
information	may result in fir	nes and/or ir	nprisonment.		Oil & Ga		complet					
(Submit 3 c	opies within 60	days of well	completion )		Well name	Maria Company	ner .					
	Oil/Gas Well				Haystea		,					
Name and address of p West Bay Exploral 13685 S. West Ba Traverse City, MI	tion y Shore #200	0		,	mayotou	,					,2	
Directionally drilled (ch		Previous p	ermit numbers		Total dept			TV	/.D. 4610tvo			
Surface location					Subsurfac	15/10/20/20	n (if dire					
NE 14 of NW 14 o	of SW 1/4 Sec	tion 9	r4S R2	2F	SW 1/4					T4S	R	2E
Township Norvell												
Footages: North	/South		East/West		Footages:	N	orth/Sou	ath		East/W	est	
2472 Ft. from Sou	th line and 12°	12 Ft. from	n West line o	of Sec.	2310	Ft. from	North	line and 3	30 Ft. f	rom We	st lin	e of Sec.
		il/gas wells		* .				Part 625 -	mineral wells			
Date well completed not	Producing for none	rmation(s)	Injection forma	ition(s)	Date of fir	st injecti			ormation(s)		on fom	nation(s)
			COMP	LETION	N INTERV	ALS(S	)				,	
·								10			Ope	
Date	Number hole			Perfo	ration or ope	en hole ir	nterval			Ye	s	No
		not	completed		1 x				-000			
			STIMULATIO	N BY A	ACID OR F	FRACT	URIN	3				
Date		Interval	treated		T		٨	laterials ar	nd amount us	ed		
	none											
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										3618	11 7	010
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	L		PPO	DUCT	ON TEST	DATA		,		2.22	i wil	
Oil	Gravity	T	Condensate	1	Gas		Water	. Т	H <sub>2</sub> S		B.H.P.	and dep
Bbls/day	°API	0	Bbls/day	0	CF/day	0	Bbls/da	0	Grains/100 f	1.		
C-05*												
CERTIFICATION stated herein are tr	'I state that I a	am authoriz	zed by said ow	ner. Th	is report wa	as prepa	ared ur	nder my s	upervision a	nd dire	ction.	The fac
		and compi		of thy K	nowieuge.							
Name and title (print Trish Rising, Fiel			Signature	Din	incl	_			100000	ate 0/6/10		
man Riang, Field		·h!-	OFFICE OF		-							
	Si	ubmit to:	OFFICE OF MICHIGAN I PO BOX 302 LANSING M	DEPAR 256	TMENT OF		ONME	NTAL QU	IALITY			

EQP 7130 (rev. 8/2004)

	MICHIGA	AN DEPAK MEN	NT OF ENVIRONMENTA	AL QUALITY - OFFICE OF 6_JLOGICA	L SURVEY	
DEQ		ATION TO:		Permit number	Type of well	
		LL STATUS	OR	60076	Dry Hole	
	☐ PLUG AND A	BANDON W	ELL	API number		¥
Required	by authority of Part 615 S	Supervisor of We	lls or Part 625 Mineral	21-075-60076-00-00	*	
Wells	s, of Act 451 PA 1994, as ion of this information ma	amended.Non-s v result in fines a	submission and/or and/or imprisonment.	Name and address of permittee	01454507	
	rt 615 Oil or Gas Well		art 625 Mineral Well	WEST BAY EXPLORATION C P.O. BOX 1203	OMPANY	
	well status requested to:		art 025 ivililerar vven	FOWLERVILLE, MI 48836	*	
☐ Plug ba	THE RESERVE THE PROPERTY OF TH	☐ Tempora	arily abandon	Well-name and number		
Conver		Other	arily abandon	HAYSTEAD 1-9		
	ction/injection rate and typ			Well location		
				NE 1/4 of NW 1/4 of SW 1/4	Section 9 T 4	S R2E
Brief descr	iption of project		**************************************	Township	County	į.
PLUG BA	ACK FOR RE-DRILL			NORVELL	JACKSON	
				Date drilling completed	Date last produced	d/utilized
				05/31/10		
Work to be		X			Starting date	
AES Rig	#2	- Zotuv Name - 1			06/1/10	
Hole dia	Cooling dia 9 val/6	Dontho not		MENTING RECORD	Cement top	Perforations
	Casing dia & wt/ft	Depths set		t quantity, type, additives		Periorations
N/A	16"	32'	Driven	ral 1 150ay Cl A 20/ CC to both	N/A	
14-3/4"	11-3/4",42#,H-40	425' 3340'		gel + 150sx CLA, 3% CC to both gel, 2% CC + 200sx CLA 3% CC	C/S C/S	
7-7/8"	8-5/8", 32#, J-55	4804'	0008x 05/35/0% (	jei, 2% CC + 2005x CLA 3% CC	0/3	
1-110		4004		***************************************		
Formation	record (formation and dep	th of top oil gas	and water shows letc.):			L
Formatio		ration top, on, gas	and nator only	***************************************		
Coldwate						
Clinton	3278'					
Trenton	4095'					
Black Riv						
Glenwoo						
RTD	4804'					
	osed procedures:					
	well. Plugs are to b					
Through	tbg spot cmt plugs a	s follows: 120	0 sxs CLA at 4200' a	and 125 sxs CLA at 3600' (kick p	lug).	
			ē			
Name/sign	ature (authorized represer	ntative):			Date:	
Name/sign	ature (authorized represer	manve).			Date.	
		FC	IR OFFICE OF GEOLOG	GICAL SURVEY USE ONLY		
DEQ addition	onal requirements:	. 10	J. I IOL OF OLOLO	a donner doe one!		
A SOCIOLOGIC CONTROL OF THE PARTY OF THE PAR						
☐Yes [	No ⊠ Not applicabl	le Production to	ests to commence within	10 days of completion and to be filed		
☐ Yes	No Service compan	y records are to	be filed			
Approved b	y DEQ()		Office:	Approval date:	Termina	tion Date:

Submit original and three (3) copies of this application to the District Office within 60 days of change of well status.

Note: Three copies of Record of Well Plugging or Change of Well status (EQP 7200-8) and any requested service company records are to be filed within 60 days of completion at the District Office.

MICHIGAN DEPARTMENT ) EN	VIRONMENT	CAL OUALITY	- OFFICE OF GEOLECULA CAL SURVEY
WATER WELL RECORD		1. Name and	address of permittee sown on oil/gas drilling permit
FOR OIL, GAS OR MINERAL WELL OPERA	TIONS	WIST.	BAY EXECUTATION CO.
Required under authority of Part 615, Supervisor of Wel	le-	7011/6	00 -18685 S, WEST BAYSHORE DR,
ur Part 625 Mineral Wells, of Act 451 PA 1994, as amend		Name and ad	ASE CITY, MI, 49684 ddress of water well drilling contractor(s)
Non-submission and/or falsification of this information may result in fines and/or imprisonment.			NEW ORILLANG INC.
		14/79-	E. MICH, AUE.
Part 615 Oil/Gas Well Part 625 Mineral	Well	BATTLE	CREK, MI. 490/4
Well name and number on oll/gas or mineral well permit.	STEA		
County JACKSON Township NORUECL		Surface loca	NW145W114 Sec 9 TYS RZE
2, Formation description	Thickness of stratum	Depth to bottom of	3. Well depth 120 Date of completion 5-(7-(0)
0-9 SAND	$\hookrightarrow$	9	4. Cable tool Rotary Driven Dug  Hollow rod Auger Jetted
7-176KEY CLAYT GLAUEL	D	1.7	5. CASING Steel Threaded Diameter Pleatic Welded
			in. to 5/ ft. depth   Height above/below
17-27 RROWN CLAY	10	27	in, toft, depth Surfaceft.
	93	120	Grouted Drill-Hole Diameter Weight OR Abs./ft
27-120 SALDROCK	7.5	(2-5)	in. to ft. depth Driver Strow MATION
			in. to 11. depth Yes No
			6. Screen
V. W. Communication of the Com	- CANADA CONTRACTOR OF THE CON	1	Type Diameter
	*		Slot/Gauze Length ft. and ft.
A LONG TO THE RESIDENCE OF THE PARTY OF THE			Fittings  K-Packer  Lead Packer  Bremer Check
///			Blank above screen ft. Other
	× .		7. Static Water Level ft. below land surface. Flowing ypm
- III			N. Vyster, level while pumping (below land surface)
			ft. after hours at 200 GPM
1000	L. C.		ft. after hours at GPM
The state of the s	ALL ANADOSTOTOT		9. Well Grouted Zyes No
			9, Well Grouted Tyes No From to 5 / It.
	- Commence		☐ Neat cement
			No, bags of second additives
			10. Pump Not installed Pump installation only Manufacturer's name
A AMAZONIA A		Handley Commence	Model number 2/50073 HP 3 Volts 230
			Length of drop pipe 20 ft. capacity 75 G.P.M.
			Type: ZSubmersible
in a second seco	- Leanemerry	A MANAGEMENT CONTROL	11. Well Head Pitless adapter 12" above grade
(use 2nd sheet if needed)			Completion Basement offset Approved plt
12. CERTIFICATION "I state that I am authorized by said owner			12. REMARKS (elevation, source of data, water quality, etc.)
prepared under my supervision and direction. The facts stated he	erein are true,	accurate	LATT, 42.16560
and complete to the best of my knowledge."  Name Registration	if any	,,,,	LONG, 84,19353
Name Registration KATZ WELL ORIUM 6 125 /	3-1593		KUNG, 84117000
Address 1879-EMRH, ACE, BATTLE	CREK	49014	
Signature Mr. Korasis Q	date	7-10	(Use a 2nd sheet or altach supplements if needed)
Submit original and 3 copies within 30 days after water well come	letion	OFFICE	OF GEOLOGICAL SURVEY

Submit original and 3 copies within 30 days after water well completion.
Diet. Original: Permit File Copies: Groundwater, Dietrict

OFFICE OF GEOLOGICAL SURVEY MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PO BOX 30256 LANSING MI 48909-7756

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY CERTIFICATION OF CASING AND SEALING OF SURFACE HOLE

Required by a	uthority of Part 615 Supervisor of Wells or	Permit number	
	al Wells, of Act 451 PA 1994, as amended	60076	
	ion and/or falsification of this information esult in fines and/or imprisonment	Well name	
may n	and of imprisonment	Haystead 1-9	
Township	County	Surface location	
Norvell	Jackson	Ne 1/4 of NW 1/4 of SW1/4 Section 9 T4S R	2E
Name and address of pe	rmittee	Name and address of drilling contractor	
West Bay Exploration	on	Advanced Energy Services	
13685 S. West Bay	Shore Dr #200	PO Box 85	
Traverse City, MI 49	9684	S. Boardman, MI 49680	
*			

#### SURFACE HOLE

Hole diameter (Note reductions	Depth to bedrock	Base of specified aquifer (see permit)	Total depth of surface hole	Formation at surface casing seat	Date drilling completed
14 3/4	88	Marshall	425	Coldwater Shale	6/7/10

none

Name and address of geologist/mud logger Trish Rising, Field Geolgist 12180 Ladd Rd

Brooklyn, MI 49230

Signature

Date

10/19/10

#### SURFACE CASING

Casing	Casing	Cement type	Amount of	Volur	ne (bbls)	Plug down
O.D. (in)	depth	and additives	cement (sacks)	Pumped	Returned to surface	date & time
11 3/4	425	Lite	175		40Bbls	10am 5/20/10
		Class A	150			

Narrative of problems encountered running or cementing casing. Note any cement fallback, grouting, or lost circulation zones.

none

Opprations Office

OCT 2 0 2010

#### I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

Signature of permittee or company officer

Submit the original and one copy, typewritten or legible printed, within 30 days after drilling is completed to:

OFFICE OF GEOLOGICAL SURVEY MICHIGAN DEPT OF ENVIRONMENTAL QUALITY

PO BOX 30256 LANSING MI 48909-7756

EQP 7200-12 (rev. 8/2004)

#### DEQ

# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

Required by a	uthority of Pa	art 615 Suner			VELL DR 5 Mineral Well				_		t numb	or/Do	oponin	g numb	0.5	
					n may result in				1			ei/De	epenin	y numb	er	
					,	API numbe				<u> </u>	00					
(Sub	mit 3 copies	within 60 d	ays of drilli	ng completi	ion.)	21-075-6 Well name				-						
Name and ad	rt 615 Oil/O		Part 62	5 Mineral	Well	Haystead Surface loc									-	
West Bay B						NE 1/4 o	***************************************	1/4 of	SV	V 1/	4 Secti	on 9	-	r4S	R2E	
13685 S. V	-		200			Township					County				1 (22 )	
Traverse C						Norvell Footages	Nor	rth/Sout	h		Jacks	son	East/	Nest		
Name and ad	dress of drilli	ng contractor				2472 ft.				d 12	12 f	fron			of sec	
McConnel						Directionall	y drilled (c	heck or	ne)		Previo				01 300	··
142 W. Ma						⊠ Yes [					none					
Homer, Mi	49254					Subsurface SE1/4 of		if direct	7	drille	ed) 4 Sectio			r 4S	R 21	F
Date drilling b	egan		Date drilling	completed		Township				- "	Cour			1 10	-11	
5/20/10			6/28/10			Columbia	а				Jac	ksor	1			
Total depth of				t total depth		Footages		rth/Sou	th				East	West		
Driller 4555t	md,4317tv	d	Black Riv	er Fm		ft.	from		line an	d	f	t. fron	n	line	e of sec	<b>3</b> .
Elevations						Feet drilled	- cable to	ols			Feet d	rilled	- rotary			
K.B. 967.26	ft. R.F. 9	66.26 ft.	R.T.	ft. Grd 9	966.26 ft	from	t	to			from 5	surf		to 4	1589	
Cools	as Casina I	inom and C	amonting C	nonetine 6	lain an		Mater	F:11 11=	/F !! \	1	4 01-		: ()	0 ) (2)		
Size	ng, Casing L Where set		ementing, C	T.O.C.	Ft. pulled	1	Water Formation	FIII UP			L.C.	_	epth		mount	
11 3/4	425'	111	e/150 A	1.0.0.	1 t. panea	Black Riv			<del>-   ·</del>	· · ·	X.	-	89m	unkne		
8 5/8	3340	600 Lite	6/			DIACK KI	vel		+		X	400	oam	unkne	JVVII	-
5 1/2	4572		Flowstop		<del> </del>		-					1	and the same			
J 1/2	7072		HalCem									$\vdash$				
			1000												************	
		s Pay Interva		T = 1		All O	ther Oil ar	nd Gas	Show	s Ob	serve	orL	ogged	erved (X	`	
	nation	Oil or Gas		To	Forma	tion	Oil or	Det	ath .	Sam		vvnei	e Obse	Mud	Gas	Fill
Trenton-Bl		Oil	4400m	4589m	Folina	idon	Gas	Del	Jui	ples		dor	Pits	Line	Log	Up
Trenton-Bl	К	Oil	4166tv	4348tv	not observ	- d	Gas	+	-	pies	-	101	1 11.5	Line	Log	10
					not observ	ea		+	-		_	-				+
									$\neg \uparrow$							
	Depth Co	orrection			Deviati	ion Survey						Plug	ged Ba	ck		
Dep	oth	Согг	ection		Run at	D	egrees	_	Yes	N	0	erati	ons C	Depth		
								-								
											- 0	CT	27	2010	-	
						-		-+		-	-					-
					*		-					M	ailed		et .	
				Geophys	ical / Mechani	ical Logs (lis	st each typ	e run)								
	Brand			· · ·	Log types		Ï				Logg	ged in	tervals			
Baker Atla	is		CNL	Density/G	R			surf-4	555m	nd					***************************************	
L						N - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				J -						
					record, and dri				-		ection.	The	facts st	ated he	rein are	e true
	d complete to					- F- SP 00 00 0										-
Date	, 1	Name and ti	itle (print)	***************************************			S	Signatur	e	7						
10 7	11 - 111						1		1 1	1 .						
1	16110	Trish Risi	ng, Field (	<u> Seologist</u>	OLOGICAL S					1.1.	SUB					

EQP 7200-5 (rev. 8/2004)

PO BOX 30256, LANSING, MI 48909-7756



Job Number: DR100160

Company: WEST BAY EXPLORATION

Lease/Well: HAYSTEAD 1-9A

Location: NORVELL TWP., JACKSON CO.

Rig Name: ADVANCED # 2

RKB:

G.L. or M.S.L.:

State/Country: MICHIGAN / USA Declination: 6.36 degrees west

File name: C:\WINSERVE\ASDRIL~1\2010\HAYSTD19.SVY

Date/Time: 10-Jun-10 / 12:23

Curve Name: HAYSTEAD 1-9 (as drilled )

#### **Directional Drilling Contractors** SURVEY REPORT

#### WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method Vertical Section Plane 292.09 Vertical Section Referenced to Wellhead Rectangular Coordinates Referenced to Wellhead

	Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O Distance FT	S U R E Direction Deg	Dogleg Severity Deg/100	
_				;							
	KICK OFF	POINT - T	IE @ 3375 M	ID							٦
	3375.00	12.70	300.20	3198.38	474.48	-840.86	957.56	965.49	299.44	.00	
~	3406.00	13.30	294.20	3228.59	477.65	-847.05	964.50	972.45	299.42	4.76	
	3436.00	15.10	286.80	3257.67	480.20	-853.94	971.84	979.70	299.35	8.51	
	3467.00	16.40	280.90	3287.51	482.19	-862.11	980.16	987.79	299.22	6.65	
	3498.00	18.00	280.50	3317.12	483.89	-871.11	989.14	996.49	299.05	5.18	
	3528.00	18.50	276.30	3345.61	485.26	-880.40	998.26	1005.28	298.86	4.69	
	3559.00	17.90	270.30	3375.06	485.82	-890.06	1007.42	1014.01	298.63	6.34	
	3590.00	17.60	267.20	3404.59	485.62	-899.50	1016.10	1022.22	298.36	3.20	
	3620.00	17.70	266.50	3433.18	485.12	-908.58	1024.32	1029.98	298.10	.78	
	3651.00	17.70	264.70	3462.71	484.40	-917.98	1032.76	1037.94	297.82	1.77	
	3682.00	17.50	266.10	3492.26	483.64	-927.32	1041.13	1045.87	297.54	1.51	
	3712.00	17.90	270.30	3520.84	483.36	-936.43	1049.47	1053.82	297.30	4.46	
	3743.00	18.60	272.40	3550.28	483.59	-946.14	1058.55	1062.56	297.07	3.10	
	3774.00	19.70	271.40	3579.57	483.93	-956.30	1068.09	1071.77	296.84	3.70	
	3804.00	20.70	271.70	3607.72	484.21	-966.66	1077.79	1081.15	296.61	3.35	
	3835.00	21.10	272.10	3636.68	484.58	-977.71	1088.17	1091.20	296.36	1.37	
	3866.00	20.90	269.60	3665.62	484.74	-988.81	1098.52	1101.24	296.12	2.96	
	3896.00	20.90	266.50	3693.65	484.38	-999.51	1108.29	1110.69	295.86	3.69	
	3927.00	20.70	266.10	3722.63	483.67	-1010.49	1118.20	1120.28	295.58	.79	
	3958.00	20.70	266.80	3751.65	482.99	-1021.38	1128.04	1129.82	295.30	1.02	
	3830.00	20.50	200.00	3731.03	402.33	-1021.30	1120.04	1123.02	280.01	1.02	
	3988.00	20.40	268.90	3779.76	482.60	-1031.85	1137.59	1139.13	295.07	2.47	
	4019.00	20.00	272.40	3808.85	482.72	-1042.55	1147.55	1148.88	294.84	4.11	
	4050.00	19.70	277.40	3838.01	483.61	-1053.03	1157.60	1158.77	294.67	5.56	
			Y								

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O Distance FT	S U R E Direction Deg	Dogleg Severity Deg/100
4081.00 4111.00	18.70 18.40	282.30 283.70	3867.29 3895.73	485.34 487.49	-1063.07 -1072.36	1167.55 1176.97	1168.62 1177.97	294.54 294.45	6.12 1.79
top									
4128.00	18.29	283.70	3911.86	488.76	-1077.56	1182.27	1183.23	294.40	.65
4142.00 4173.00 4203.00 4234.00	18.20 18.30 19.00 19.10	283.70 280.90 277.70 277.70	3925.16 3954.60 3983.03 4012.33	489.79 491.86 493.41 494.76	-1081.82 -1091.30 -1100.77 -1110.80	1186.60 1196.17 1205.52 1215.32	1187.53 1197.03 1206.29 1216.00	294.36 294.26 294.14 294.01	.65 2.85 4.13 .32
4265.00 4295.00 4326.00 4357.00 4388.00	18.90 18.10 18.00 18.00 18.90	277.40 273.80 272.80 273.10 273.80	4041.64 4070.09 4099.57 4129.05 4158.45	496.09 497.02 497.58 498.07 498.66	-1120.80 -1130.27 -1139.86 -1149.43 -1159.22	1225.09 1234.21 1243.31 1252.36 1261.65	1225.68 1234.72 1243.73 1252.70 1261.92	293.88 293.74 293.58 293.43 293.28	.72 4.65 1.05 .30 2.99
4418.00 4449.00 4480.00 4510.00 4541.00	19.10 19.90 19.70 19.80 20.00	273.50 273.80 274.20 273.50 274.20	4186.82 4216.04 4245.21 4273.44 4302.59	499.28 499.94 500.67 501.35 502.06	-1168.97 -1179.29 -1189.77 -1199.88 -1210.41	1270.92 1280.73 1290.72 1300.34 1310.37	1271.13 1280.89 1290.82 1300.41 1310.40	293.13 292.97 292.82 292.68 292.53	.74 2.60 .78 .86 1.00
4579.00 TD 1-9A @	20.16	273.64	4338.28	502.95	-1223.43	1322.76	1322.77	292.35	.65
4589.00	20.20	273.50	4347.67	503.17	-1226.87	1326.03	1326.04	292.30	.65

## DES

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

DEST			RECORD O	F WEI	LL COMP	PLETIO	N			
					Permit numb	er/deepenir	ng permit n			
			act 451 PA 1994, alsification of this		60106			21-075-60	0076-01-0	00
	on may result in f				Type of well	(after comp	letion)			
				*	Oll & Gas					
(Submit 3	copies within 60	days of we	ell completion.)	18	Well name 8	number				
	15 Oil/Gas Well	Part 6	25 Mineral Well		Haystead	1-9A				
Name and address of West Bay Explor I 3685 S. West E Fraverse City, M	ation Bay Shore Dra	<b>#</b> 200			8					
Directionally drilled (		Previous 60076	permit numbers		Total depth M.D. 4589	of well		r.v.d. 4348		
Surface location		1			Subsurface	location (if o				
NE 1/4 of NW 1/4	of SW 1/ Se	ction 9	T4S R	2E		0.0000000000000000000000000000000000000	-	Section 8	T4S	R 2E
ownship	401000 /406	County	140 17	24	Township	10L /40	JI 11L /	County	140	NZL
Vorvell		Jackson	n	×	Columbia			Jackson		
Control of the contro	th/South	-	East/West	****	Footages:	North/S	South		East/West	
2472 Ft. from Sc		12 Ft fr		of Sec		t. from Nor		120 F+ 6		line of Sec.
21/2 12 1011 00		oil/gas wells			2010			- mineral wells		1110 01 000.
Date well completed				ation(s)	Date of first	injection		formation(s)		formation(s)
6/2/10	BR	,	none		none		none		none	
Date	Number ho		02-4512'	Perfor	ration or open	hole interva	al		Yes	Open No X
6/25/10	4		12-4430		*					χ .
								V7500000		
			STIMULATIO	ON BY A	CID OR FI	RACTURI				
Date	4500 4540		al treated		500-000	V 1101	Materials	and amount us	ea	
6/24/10	4502-4512				500g 28°				<del></del>	
6/25/10	4412-4430				500g 28°	% HCI				No bod
	<del></del>				-			Ope	rations C	ornce
	<del></del>								- N	2010
	-				·	·		. 1	CT 7.7	7010
	1				-					
				•			16		Pratter	
	3		PRO	DUCTION	ON TEST [	DATA	>			
Oil Bbls/day	Gravity °API		Condensate Bbls/day	T	Gas CF/day	Wat Bbls/		H₂S Grains/100 f	B.ì	I.P. and dep
24	42	0		0		194		0	not	determine
CERTIFICATION stated herein are Name and title (prin	true, accurate			of my kr		s prepared	under my	· .	nd direction	on. The fac
Trish Rising, Fi				ZOLA	G-				10-3	C IC.

Submit to:

OFFICE OF GEOLOGICAL SURVEY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PO BOX 30256

LANSING MI 48909-7756

## DES

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

Required by a	uthority of Parl	615 Sunan			VELL DR										
	on-submission										er/Deepe	ening	numbe	r	
	THE CUBITION OF THE	u, i u, o, i u i o, i i			inay result in	API number			6010	)6					
(Sub	omit 3 copies v	within 60 da	ays of drillin	ng completi	on.)	21-075-60 Well name a	0076-01-0								
⊠ Pa	rt 615 Oil/G	as Well	Part 62	5 Mineral	Well	Haystead									
Name and add	dress of permit	ttee				Surface loca		+3							
West Bay E	Exploration					NE 1/4 of	NW 1	1/4 of	SW 1/	4 Section	on 9	T4	IS	R2E	
13685 S. W	Vest Bav Sh	ore Dr #2	00			Township				County					٠
	City, MI 4968					Norvell Footages		h/South		Jacks	E	ast/W			
	dress of drilling	g contractor				2472 ft.	from Sou	uth line	and 12					of sec	
McConnel					*	Directionally		ieck one		Previou	ıs permi	t num	ibers		
142 W. Ma						Yes Subsurface		f direction	olly deill	none					
Homer, MI	49254					SE1/4 of			NE 1/		n 8	т	48	R 2	=
Date drilling b	pegan		Date drilling	completed		Township	1	-		Cour		<u> </u>			
5/20/10			6/28/10			Columbia	1			Jacl	kson				
Total depth of	f well		Formation a	t total depth		Footages		th/South				ast/\	/est		
	md,4317tvd		Black Riv	er Fm		ft.	from	line	and		t. from			of sec	
Elevations						Feet drilled	- cable too	ols		Feet d	rilled - ro	tary t	ools		
K.B. 967.26	ft. R.F. 96	6.26 ft. I	R.T.	ft. Grd 9	66.26 ft	from	to	)		from S	surf		to 4	589	
				100											
Size	ng, Casing Lir Where set		ementing, C ment	T.O.C.	Ft. pulled	F	Water F Formation	Fill Up (F	.U.) or L F.U.	ost Circ	Dept			mount	
11 3/4	425'	175 Lite		1 Por	T to puncu	Black Riv			1	X	4589	-	unkno		-
8 5/8	3340	600 Lite			<b>+</b>	DIALK KI	/61		1	X	4509	шН	unkno	5A411	
5 1/2	4572		lowstop	7						-		$\neg$			
O IIZ	17072		HalCem	2 8 B B B	1 /							$\neg$		~~~	
			No.	L Acres	No. of Land	1 (			1						
					1.12.411										
		Pay Interva				All O	ther Oil an	d Gas S	hows O						
	nation	Oil or Gas		То			011	5 0			Where (	Joser			T =
Trenton-Bl		Oil	4400m	4589m	Forma	auon	Oil or Gas	Depth					Mud	Gas	Fil
Trenton-Bl	R	Oil	4166tv	4348tv			Gas	1	ple	S O	dor P	its	Line	Log	Up
					not observ	ea		-	-	_	-	-+			+
			1	<del>                                     </del>				<b> </b>	_	_		-			$\vdash$
					<b>L</b>			1			1			7	
	Depth Cor	rection			Deviat	ion Survey					Plugge	d Bac	k		
Dep	pth	Corre	ection		Run at	D	egrees	Y	es I	NO ~	irsilor	16 23	Depth		
		-													
										254	1677	7 5	910		
										14,6	). 	1 2.2	(a) 142		
					***************************************						hai!	lari			
				Geophys	ical / Mechan	ical Logs (lis	st each type	e run)			1. 14.2	1			
	Brand				Log types	2090 /110	1	/		Logo	ged inter	vals			
Baker Atla			CNI /	Density/G			5	surf-45	55md						
Danoi / the			1												
1									!-!-						
		and f	ormation red	cord, coring	record, and dr	ııı stem test ir									
	ort complete sa					and the second second					Death to The Control of the Control				e frue
CERTIFICA	ort complete sa TION "I state to d complete to I	that I am au	thorized by	said owner. je."	This report wa	as prepared ι	under my s	upervisio	n and di	rection.	The fac	ts sta	ated he	rein are	
CERTIFICA accurate and Date	TION "I state to did complete to i	that I am au	thorized by ny knowled	said owner. ge."	This report wa	as prepared u		upervisio		•		ts sta	ated he	rein are	
CERTIFICA accurate and Date	TION "I state to to	that I am au the best of r	ithorized by my knowledo itle (print) ng, Field (	ge." Geologist	This report was	3				nection.		ts sta	ated he	rein are	

EQP 7200-5 (rev. 8/2004)

PO BOX 30256, LANSING, MI 48909-7756



# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF GEOLOGICAL SURVEY RECORD OF WELL COMPLETION

							a nemut no			
and the second second	y of Part 615 or Part				60106	mber/deepenin	g permit 110.	API number 21-075-60		00
	d. Non-submission			5		ell (after compl	etion)	21-070-00	0010-01-	-
informatio	on may result in fi	nes and/or i	mprisonment.		Oll & Ga					
(Submit 3	3 copies within 60	days of we	Il completion.)			e & number				
Part 6	15 Oil/Gas Well	Part 62	5 Mineral Well		Haystea					
Name and address of West Bay Explor 13685 S. West E Fraverse City, M	ration Bay Shore Dr#	200				,				*
Directionally drilled (		Previous p	ermit numbers		Total dept		T.\	/.D. 4348		
Surface location					Subsurfac	ce location (if d	irectionally d	rilled)	***************************************	
NE 1/4 of NW 1/2	4 of SW 1/4 Sec	ction 9	T4S R	2E	SE 1/4	of SE % o	fnE %s	Section 8	T4S	R 2E
ownship Norvell	*	County Jackson			Township Columb			County Jackson		
	th/South		East/West		Footages	: North/S	outh		East/West	
2472 Ft. from Sc	outh line and 12°	12 Ft. fro	m West line	of Sec.	2310	Ft. from Nort	h line and 2	0 Ft. fr	rom East	line of Sec.
	Part 615 - c							mineral wells		
Date well completed 6/2/10	Producing for BR	rmation(s)	Injection form none	ation(s)	Date of fir none	rst injection	Disposal fo	ormation(s)	Solution	formation(s)
*			COMF	PLETION	INTERV	ALS(S)		199		
Data	Number hole			Dorfo	ention or one	an hala intanıa	i			Open
Date 5/24/10	4		2-4512'	Perior	ation or ope	en hole interva	· · · · · · · · · · · · · · · · · · ·		Yes	No
3/25/10	4		2-4512 2-4430							X
			STIMULATIO	ON BY A	CID OR I	FRACTURII	NG			
Date		Interval		ON BY A				nd amount use	ed	
6/24/10	4502-4512			ON BY A	500g 28	8% HCI		nd amount use	ed	
6/24/10	4502-4512 4412-4430			ON BY A	500g 28					NEST
6/24/10				ON BY A	500g 28	8% HCI			ed rations C	Office
6/24/10				ON BY A	500g 28	8% HCI			rations C	office 2010
6/24/10				ON BY A	500g 28	8% HCI			rations C	
Date 6/24/10 6/25/10		Interval	treated		500g 28	8% HCI 8% HCI			rations C	
6/24/10		Interval	treated	DDUCTIO	500g 26 500g 26	8% HCI 8% HCI	Materials an		Mailen  B.F	70\0
6/24/10 6/25/10 Oil Bbls/day	4412-4430 Gravity	Interval	PRC Condensate	DDUCTIO	500g 28 500g 28 500g 28	8% HCI 8% HCI DATA	Materials an	Oper U(	Mailen  B.F	2010
6/24/10 6/25/10	Gravity °API 42	Interval 0	PRC Condensate Bbls/day	DDUCTION MC	500g 26 500g 26 500g 26 500g 26 50N TEST Gas CF/day	DATA  DATA  Wate Bbls/d  194	Materials and	Oper UK H <sub>2</sub> S Grains/100 ft	Mailed  B.F. not	A.P. and dept

LANSING MI 48909-7756

EQP 7130 (rev. 8/2004)

#### DES

#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

Required by a			RECO						anna.	9						
	uthority of Part								F	ermi	t numb	er/De	epenin	g numb	er	
amended. No	n-submission	and/or falsif	ication of th	is informatio	n may result in			nent.		3010	6					
						API number	r									
(Sub	mit 3 copies v	vithin 60 da	ays of drilli	ng complet	ion.)	21-075-6 Well name										
	rt 615 Oil/Ga		Part 62	25 Mineral	Well	Haystead Surface loc										
West Bay B						NE 1/4 of		1/4 of	SV	V 1/	4 Secti	on 9	-	r4S	R2E	
The second secon	Vest Bay Sh	ore Dr #2	nn			Township		17 7 01	-	1	County			110	1 (20 1	
	ity, MI 4968					Norvell					Jacks	con.			*	
	, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	•				Footages	Nort	th/Sout	n		odone	2011	East/	Nest		
Name and ad	dress of drilling	contractor				2472 ft.				d 12	12 fi	. fron	n We	st line	of sec	<b>:</b> .
McConnel (	& Scully					Directionall	_	heck or	e)	-	Previo	us pe	mit nu	mbers		
142 W. Ma	in St.					Yes       Less       Less       Less       Ses       Less       Ses       Ses					none					, 4;
Homer, MI	49254					Subsurface						_	102			_
Date drilling b	0000		Data drilling	completed		SE1/4 of Township	SE1	/4 of	NE	= 1/4	Section			T 4S	R 2	<u> </u>
	egan	1		completed							Cour	•				
5/20/10 Total depth of	well		6/28/10 Formation a	at total depth	)	Columbia Footages		th/Sout	h		Jac	ksor	East/	West		
	nd,4317tvd	1	Black Riv				from		ine an	d	4	t. fron			of sec	
Elevations	, 1017100		DIACK INIV	CI III		Feet drilled			all				- rotary		01 360	
	ft. R.F. 966	3.26 ft. I	R.T.	ft. Grd 9	966.26 ft	from	to				from S		,		589	*
Casir	ng, Casing Lin	ers and Ce	ementing, C	perating S	trings	,	Water F	Fill Up	(F.U.)	or L	ost Cir	culat	ion (L.	C.) (X)		
Size	Where set	Cer	ment	T.O.C.	Ft. pulled	F	Formation		F	.U.	L.C.	D	epth	P	mount	
11 3/4	425'	175 Lite				Black Riv	ver				Х	45	89m	unkno	own	
8 5/8	3340	600 Lite			ļ				_							
5 1/2	4572		lowstop	-	-	-			_			-				
		2" 200	HalCem	-	-	<b> </b>						-				-
	L				<del></del>	l										-
	Gross	Pay Interva	ls			All O	ther Oil an	nd Gas	Show	e Oh	SANAC	lorl	onned			-
Form		Oil or Gas	From	То		711 0	ther On an	003	0.1044	3 01				erved (X	)	
Trenton-Bf	3	Oil	4400m	4589m	Forma	ation	Oil or	Dep	th	Sam	1-			Mud	Gas	Fil
Trenton-BF		Oil	4166tv	4348tv			Gas			ples	O	dor	Pits	Line	Log	Up
					not observ			1								_
		***			HOL ODSELV	ed		-	_			-				_
TO HOUSE					Hot observ	ed			寸							
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Dep	Depth Core	rection Corre	ection			ion Survey	egrees		Yes	N		-	ged Ba			
	Depth Core		ection		Deviati	ion Survey	egrees		Yes	N		-	ons C	Depth		
	Depth Core		ection		Deviati	ion Survey	egrees		Yes	N		-	ons C			
	Depth Core		ection		Deviati	ion Survey	egrees		Yes	N		-	ons C	Depth		
	Depth Core		ection		Deviati	ion Survey	egrees		Yes	N		CT	ons C	Depth		
	Depth Core		ection		Deviati	ion Survey			Yes	N	0 0 0	CT M	ens C 2.7 d	Depth 2010		
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Dep  Baker Atla  Notice: Repo	Depth Corrotth  Brand S  rt complete sai	Corre	CNL/	Geophys Density/G	Deviati Run at  ical / Mechani Log types R	ion Survey Discal Logs (list	st each type §	e run) surf-45	555m	nd de.	Logg	M jed in	alled tervals	Pepth 2010	rein are	e true
Dep Baker Atla Notice: Repo CERTIFICAT accurate and	Brand S  rt complete sai	Corre	CNL/ crmation rec horized by some strong the control of the contro	Geophys Density/G	Deviati Run at  ical / Mechani Log types R	ion Survey Discal Logs (list	st each type   e run) surf-45 on reve	555m	nd de.	Logg	M jed in	alled tervals	Pepth 2010	rein are	e true	
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EQP 7200-5 (rev. 8/2004)

PO BOX 30256, LANSING, MI 48909-7756

# FORMATION RECORD Attach additional sheets if necessary Geologist name

API numbe	r			
21.075	LECC	7(1	L	100
Tops taken fr	om			

Permit number/Deepening number 60076

Elevation used 967,26

Trish Rising, West Bay Exploration

Driller's log

Sample log

		Formation			Formation
From	То	(type, color, hardness)	From	То	(type, color, hardness)
Note: if well where approp	directionally dri	lled, add true vertical depth formation tops			
		Clinton Em			
KOP	3787md	Clinton Fm			
3375md	3583tvd	dolomite with shaley intervals-drk gray grading to It gry, brn, dns			
3787md	4127md	Utica Fm			
3583tvd	3911tvd	shale-drk gry/blk, vfxln, hrd			
4127md	4478md	Trenton Fm			
3911tvd	4243tvd	dolomite and limestone, lt/drk brn, vfxln, mhd, cln, scat fossils/pyr			
4478md	4555md	Black River Fm		· ·	
4243tvd	4317tvd	limestone and dolomite-md drk brn,			
12 10010		arg, wh/off wh dol, mhd, arg			
		1			1
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				as cored, attach core	
				DRILL STEM TEST DA	ATA
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Operations Office

OCT 2 7 2010

Mailed

HAYSTEAD 1-9

FORMATION RECORD

Attach additional sheets if necessary

Elevation used Geologist name

API number

Permit number/Deepening number

31.015 troc7tr c1 30 60076

Tops taken from

967.26 Trish Rising, West Bay Exploration Driller's log Sample log Electric log Formation Formation From (type, color, hardness) From To (type, color, hardness) Note: if well directionally drilled, add true vertical depth formation tops where appropriate KOP 3787md Clinton Fm 3583tvd dolomite with shaley intervals-drk 3375md. gray grading to It gry, brn, dns 3787md 4127md Utica Fm 3911tvd shale-drk gry/blk, vfxln, hrd 3583tvd 4127md 4478md Trenton Fm 4243tvd dolomite and limestone, It/drk brn, 3911tvd vfxln, mhd, cln, scat fossils/pyr 4478md 4555md Black River Fm limestone and dolomite-md drk brn, 4243tvd 4317tvd arg, wh/off wh dol, mhd, arg If well was cored, attach core description DRILL STEM TEST DATA Coeracions Office ACT 7 7 70的 3-aligo LIST ATTACHMENTS OFFICE OF GEOLOGICAL SURVEY USE ONLY Reviewed by

eliseatoni) le compresentation et to

Job Number: DR100160

Company: WEST BAY EXPLORATION

Lease/Well: HAYSTEAD 1-9A

Location: NORVELL TWP., JACKSON CO.

Rig Name: ADVANCED # 2

RKB:

G.L. or M.S.L.:

State/Country: MICHIGAN / USA Declination: 6.36 degrees west

Grid:

File name: C:\WINSERVE\ASDRIL~1\2010\HAYSTD19.SVY

Date/Time: 10-Jun-10 / 12:23

Curve Name: HAYSTEAD 1-9 (as drilled )

# Directional Drilling Contractors SURVEY REPORT

#### WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method Vertical Section Plane 292.09 Vertical Section Referenced to Wellhead Rectangular Coordinates Referenced to Wellhead

	Measured	Incl	Drift	True			Vertical	CLO	SURE	Dogleg	
	Depth FT	Angle Deg	Direction Deg	Vertical Depth	N-S FT	E-W FT	Section FT	Distance FT	Direction Deg	Severity Deg/100	
-											
	KICK OFF	POINT - T	TE @ 3375 M	D		•					
	3375.00	12.70	300.20	3198.38	474.48	-840.86	957.56	965.49	299.44	.00	
	3406.00	13.30	294.20	3228.59	477.65	-847.05	964.50	972.45	299.42	4.76	
	3436.00	15.10	286,80	3257.67	480.20	-853.94	971.84	979.70	299.35	8.51	
	3467.00	16.40	280.90	3287.51	482.19	-862.11	980.16	987.79	299.22	6.65	
	3498.00	18.00	280.50	3317.12	483.89	-871.11	989.14	996.49	299.05	5.18	
	3528.00	18.50	276.30	3345.61	485.26	-880.40	998.26	1005.28	298.86	4.69	
	3559.00	17.90	270.30	3375.06	485.82	-890.06	1007.42	1014.01	298.63	6.34	
*	3590.00	17.60	267.20	3404.59	485.62	-899.50	1016.10	1022.22	298.36	3.20	
	3620.00	17.70	266.50	3433.18	485.12	-908.58	1024.32	1029.98	298.10	.78	
	3651.00	17.70	264.70	3462.71	484.40	-917.98	1032.76	1037.94	297.82	1.77	
							·				
	3682.00	17.50	266.10	3492.26	483.64	-927.32	1041.13	1045.87	297.54	1.51	
	3712.00	17.90	270.30	3520.84	483.36	-936.43	1049.47	1053.82	297.30	4.46	
	3743.00	18.60	272.40	3550.28	483.59	-946.14	1058.55	1062.56	297.07	3.10	
	3774.00	19,70	271.40	3579.57	483.93	-956.30	1068.09	1071.77	296.84	3.70	
	3804.00	20.70	271.70	3607.72	484.21	-966.66	1077.79	1081.15	296.61	3.35	
	3835.00	21.10	272.10	3636.68	484.58	-977.71	1088.17	1091.20	296.36	1.37	
	3866.00	20.90	269.60	3665.62	484.74	-988.81	1098.52	1101.24	296.12	2.96	
	3896.00	20.90	266.50	3693.65	484.38	-999.51	1108.29	1110.69	295.86	3.69	
	3927.00	20.70	266.10	3722.63	483.67	-1010.49	1118.20	1120.28	295.58	.79	
	3958.00	20.50	266.80	3751.65	482.99	-1021.38	1128.04	1129.82	295.31	1.02	
	3000.00	20.00	200.00	0101.00	102.00	1021.00	1120.07	. 120.02	200.01	1.02	×
	3988.00	20.40	268.90	3779.76	482.60	-1031.85	1137.59	1139.13	295.07	2.47	
	4019.00	20.00	272.40	3808.85	482.72	-1042.55	1147.55	1148.88	294.84	4.11	1
	4050.00	19.70	277.40	3838.01	483.61	-1053.03	1157.60	1158.77	294.67	5.56	

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O Distance FT	S U R E Direction Deg	Dogleg Severity Deg/100
4081.00 4111.00	18.70 18.40	282.30 283.70	3867.29 3895.73	485.34 487.49	-1063.07 -1072.36	1167.55 1176.97	1168.62 1177.97	294.54 294.45	6.12 1.79
top				•			9		
4128.00	18.29	283.70	3911.86	488.76	-1077.56	1182.27	1183.23	294.40	.65
4142.00 4173.00 4203.00 4234.00	18.20 18.30 19.00 19.10	283.70 280.90 277.70 277.70	3925.16 3954.60 3983.03 4012.33	489.79 491.86 493.41 494.76	-1081.82 -1091.30 -1100.77 -1110.80	1186.60 1196.17 1205.52 1215.32	1187.53 1197.03 1206.29 1216.00	294.36 294.26 294.14 294.01	.65 2.85 4.13 .32
4265.00 4295.00 4326.00 4357.00 4388.00	18.90 18.10 18.00 18.00 18.90	277.40 273.80 272.80 273.10 273.80	4041.64 4070.09 4099.57 4129.05 4158.45	496.09 497.02 497.58 498.07 498.66	-1120.80 -1130.27 -1139.86 -1149.43 -1159.22	1225.09 1234.21 1243.31 1252.36 1261.65	1225.68 1234.72 1243.73 1252.70 1261.92	293.88 293.74 293.58 293.43 293.28	.72 4.65 1.05 .30 2.99
4418.00 4449.00 4480.00 4510.00 4541.00	19.10 19.90 19.70 19.80 20.00	273.50 273.80 274.20 273.50 274.20	4186.82 4216.04 4245.21 4273.44 4302.59	499.28 499.94 500.67 501.35 502.06	-1168.97 -1179.29 -1189.77 -1199.88 -1210.41	1270.92 1280.73 1290.72 1300.34 1310.37	1271.13 1280.89 1290.82 1300.41 1310.40	293.13 292.97 292.82 292.68 292.53	.74 2.60 .78 .86 1.00
4579.00 TD 1-9A @	20.16 <b>2589 MD</b>	273.64	4338.28	502.95	-1223.43	1322.76	1322.77	292.35	.65
4589.00	20.20	273.50	4347.67	503.17	-1226.87	1326.03	1326.04	292.30	.65



#### APPENDIX 5

SPL Inc. 459 Hughes Drive Traverse City, MI 49686

Phone: (231) 947-5777 Fax: (231) 947-1072

#### **GENERAL WATER ANALYSIS**

WorkOrder: T10080299 LANTIS 2-30 WELL

Lab ID:

T10080299001

Sample ID: LANTIS 2-30 WELL

Date/Time Received: 8/26/2010 10:51

Water

Matrix:

Date/Time Collected: 8/19/2010 12:30

Method	Parameters	Results	Analyzed
	ANION		
EPA 310.1	Alkalinity, CO32- as CaCO3	ND mg/l	09/02/2010 14:19 by MD
EPA 310.1	Alkalinity, HCO3- as CaCO3	230 mg/l	09/02/2010 14:19 by MD
EPA 325.2	Chloride	174000 mg/l	09/10/2010 16:27 by MD
EPA 375.4	Sulfate	315 mg/l	09/09/2010 14:20 by MD
EPA 376.2	Sulfide	ND mg/l	09/09/2010 15:49 by JS
	CATION		
EPA 200.8	Calcium	28400 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Magnesium	4870 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Potassium	3000 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Sodium	37600 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Barium	2.25 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Iron	81.4 mg/l	09/09/2010 22:39 by JS
	OTHER		* 1
EPA 150.1	pH	6.1 SU	09/03/2010 11:59 by MD
EPA 120.1	Resistivity	0.0460 ohm-meter	09/03/2010 00:37 by MD
ASTM D1429	Specific Gravity	1.193	09/08/2010 14:39 by JS
	Total dissolved solids (calculated) =	248498.65	